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NELSON'S NEW DRAWING COURSE

BY
J. VAUGHAN



TEACHER'S HANDBOOK

DRAWING,
DESIGN, &
MANUAL
OCCUPA-
TIONS

STAGE 5

PRICE 2/6

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NELSON'S NEW DRAWING COURSE

Teachers' Handbook

NELSON'S
NEW DRAWING COURSE

Drawing, Design, and Manual Occupations

BY

J. VAUGHAN

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STAGE V.

THOMAS NELSON AND SONS

London, Edinburgh, and New York

1905

PREFACE.

WITHIN the past few years the teaching of Drawing has assumed an entirely new position. It is no longer looked upon as being suitable only for the few, but as being necessary for all; not as an accomplishment, but as an integral part of education, powerful in cultivating the intelligence, as well as in developing hand skill. The scope of the subject, too, has broadened out. Most schemes now include drawing from objects and from nature as well as from copies, and also embrace one or more of the "manual occupations"—brush drawing, clay modelling, cardboard modelling, woodwork, and the like.

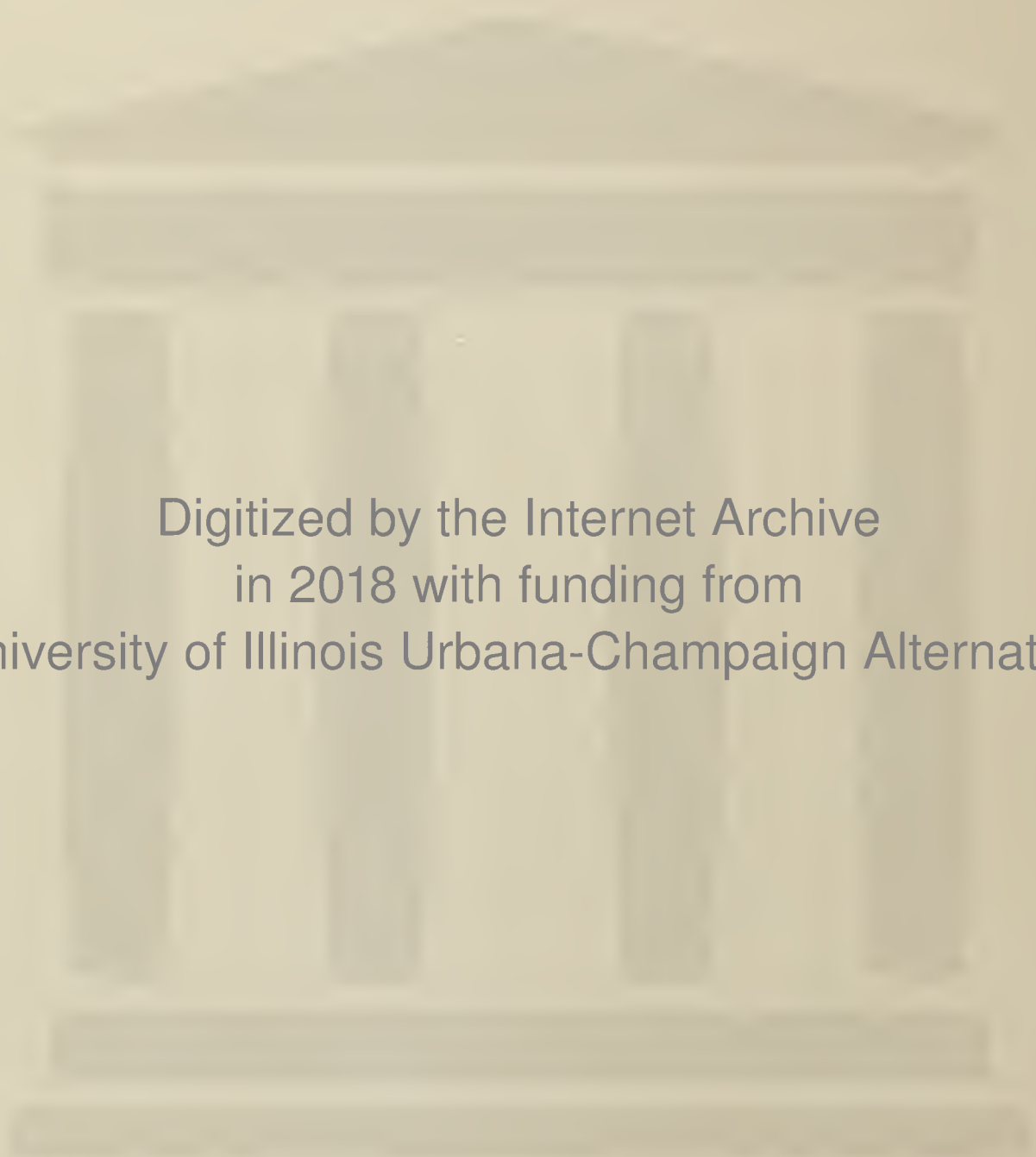
This widening of the scope of the subject—both educationally and practically—renders it all the more necessary that the work should be done on systematic lines, with graduation and cohesion in each separate branch, and also with due correlation between the branches.

The examples given in the plates must be taken only as illustrating the principles laid down. In themselves they have no intrinsic merit, and other exercises just as suitable may be evolved; indeed, it may almost be said that the measure of success attained—especially from an educational point of view—will be in direct ratio to the degree in which teachers put *themselves* into the work.

The division of the work into definite periods of time should be of great service to head teachers in connection with term examinations.

It will not, of course, be possible to do all the work shown in this course. As a rule, *one* occupation in connection with drawing is found sufficient. On the other hand, in addition to the formal exercises here treated of, as much encouragement as possible should be given to spontaneous drawing—that is, the free sketching of anything that takes the children's fancy. Such drawing cannot be included in a systematic course, but is of the greatest service in awakening interest and in developing individuality and power.

J. V.



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THE PLACE OF DRAWING AND OTHER MANUAL OCCUPATIONS IN PRIMARY EDUCATION.

DURING the past decade the subject of Drawing has played an important part in the arena of education. It seems but yesterday that it was classed among the "optional" subjects of the elementary school curriculum. Less than fifty per cent. of boys' schools, and practically no girls' schools, availed themselves of the opportunity of teaching it. In many of those which did take it, Drawing was

looked upon merely as a means by which an extra shilling or two of grant could be earned. But Drawing *as a means of education*, as a powerful agent in stimulating all those faculties that conduce to complete living, was scarcely thought of. Nor was the case much better in private schools. There the pupils, by the united efforts of the drawing-master and the frame-maker, produced the radiant landscapes which were destined to occupy a prominent position in the family drawing-room. But the power to really *draw* even the simplest objects seen in everyday life was altogether lacking.

A better day, however, has dawned. Drawing is now taken in every boys' school in England, and in most girls' schools too, and I venture to think there are few teachers who would question its educational utility. Recently too, Drawing, in common with other subjects taught in public elementary schools, has received the inestimable advantage of being relieved from a stereotyped course. Now both teachers and pupils may put themselves into the work, and render the subject what it should be—an enjoyable, stimulating educational process, and a real training of hand and eye.

But though the place of *Drawing* as a necessary part of education may be taken as assured, that of other forms of handwork, known as *Hand and Eye Training*, *Manual Occupations*, or *Manual Training*, still hangs in the balance, as it were. True, the present English Code lays down the rule that all Drawing schemes should embrace some simple form of manual occupation; the Scottish and Irish authorities also recognize the educational value of manual work, and encourage it in their schools. In the United States, in Canada, in Australia, and in many European countries, some form of handwork is looked upon as essential in the curriculum of all schools.

The verdict of those who have tried a systematic and rational course of handwork, related to and developed from the kindergarten occupations, is emphatically in its favour. It is difficult to see how it could be otherwise, for manual work is the natural complement of drawing. Each subject assists the other—if, indeed, they can be looked upon as two distinct subjects—and I hope the time may not be far distant when handwork, in its widest sense, shall be looked upon as necessary to a complete education. The scheme developed and illustrated here may perhaps do something towards removing the doubts of those who still question the educational value of handwork.

Though these pages are intended to deal mainly with the practical side of the work, it may not be out of place to show, very briefly, the bearing of Handwork upon education generally. First let us ask ourselves what is meant by education. Herbert Spencer defined it as “the preparation for complete living.” Commenting upon this, Dr. Gunn, in his excellent articles on “The Case for Manual Training in Schools,” published in *The Practical Teacher* some time ago, says: “Whatever ‘complete living’ may imply for the individual or for the nation, it implies something more than a ‘bare living.’ Our curriculum of school studies *may* provide for training the feelings and the taste; it *must* provide for training the hand and the eye.

“It would seem that in our common school education, as in the evolution of dress, we have attended first to decoration, and afterwards—a long way afterwards—to practical utility. We have given much attention to the head—little to the hand; we have laid much stress on thinking—little on doing; we have put much value on capacity—little on faculty. But manual training is at last asserting its place. Educationists are beginning to see that whatever education may include, *that* at least cannot be excluded.”

A further thought arises on this point. “Complete living” must also include what is called “living with the times.” In education, as in everyday life, the modes and manners of fifty years ago will not suffice. It is necessary to our well-being that we should take advantage of the advances which have been made in science, surgery, etc.

Education has also been defined as “the just and legitimate familiarity between mind and things;” and again, as “that which multiplies the power of the eye to see and of the hand to produce.” If either of these conceptions be true, it follows that some kind of manual work must be done in order that the pupil may secure this power of judgment and capacity; for it cannot be said that mere bookwork makes us familiar with things, or that it in any sense cultivates the power of the hand to produce.

True education must not consist of the mere acquisition of knowledge through books; it must deal also with realities—with things. “The hand is of the most vital importance intellectually, for by its action the mind is led to understand the various objects. To touch, to examine, to imitate, belong to the hand and the eye as much as to the mind; without the training of these organs, and the bringing of them together in their action, we are certainly neglecting that class of culture which, to ninety-five per cent. of the people, is of most use.”

To those who study the question even superficially, there can be no room for doubt

that the training of the hand is of the greatest value educationally. Even if we ignored its immense influence on the ordinary occupations of after life, manual work would still be worth its place in the curriculum of every school, as a training in thought, in accuracy, in expression—as a factor in “the harmonious development of all the powers of a human being.”

Men eminently distinguished in various walks of life have written in favour of Handwork as a necessity in education. Sir James Crichton Browne advocates it in order that there may be an even development of the brain, especially the motor centres. The late Professor Huxley wrote: “If there were no such things as industrial pursuits, a system which does nothing for the faculties of observation, which trains neither the eye nor the hand, and is compatible with utter ignorance of the commonest natural truths, might still be reasonably regarded as strangely imperfect. But when we consider that the instruction and training which are lacking are exactly those which are of most importance for the mass of our population, the fault becomes almost a crime, the more so that there is no practical difficulty in making good these defects.” The late Mr. T. G. Rooper, one of His Majesty’s Inspectors of Schools, who has given close attention to educational methods, says: “Handwork is the only kind of instruction in which you can make certain that the learner is not trusting to words, and words only.” Mr. George Ricks, Inspector for the London School Board, who was one of the pioneers of educational handwork in England, writes: “While the eye is being trained to accuracy, and the hand to dexterity and manipulative skill, the mind is being trained to observation, attention, comparison, reflection, and judgment. The essence lies in *doing*, not in the thing done, and is only valuable in proportion to the demand it makes upon the intelligence.”

The Commission on Manual and Practical Instruction (Ireland) probably made one of the most exhaustive inquiries into the question of drawing and manual training that have ever been attempted in this or in any other country. In their final report the Commissioners say: “It is felt that even primary education has a wider scope than the teaching of reading, writing, and arithmetic, or even than the development of the intellectual faculties in general, and that some cultivation of manual dexterity for its own sake may fairly claim to be a proper object of every well-ordered system of primary education. It is maintained, too, by writers of authority that the cultivation of manual dexterity reacts advantageously upon the intellectual faculties, and is an important aid to their development.....It is a matter of experience that manual exercises of the kind to be described in this section of our Report do, in fact, constitute an instrument in some respects more suitable and convenient than other school studies for attaining certain intellectual and moral results which are of high value in the training of the child. We may here, for the sake of clearness, distinguish, in accordance with the view now generally accepted, between two objects aimed at in the practice of manual exercises in school—the direct and the indirect. The direct object is the acquirement by the children of a general manual dexterity which shall render the hand a more efficient servant of the brain in all circumstances. It is to be observed, even from this point of view, that a *general* manual dexterity is to be aimed at, not the *special* dexterity suitable

to a particular trade. The indirect object is the mental and moral discipline referred to above. Of the two objects, although the first is not to be neglected, and although it cannot be neglected if the second is to be attained, the second is, for school purposes, incomparably the more important, and must be the main consideration in determining the course of instruction to be pursued. Experience shows that it is this aspect of school manual exercises which teachers are most likely to overlook, and it therefore requires to be dwelt upon with greater insistence."

Many more opinions might be quoted, and arguments advanced, on this point, but perhaps sufficient has now been said to show that education must include something more than mere bookwork, something more than can be obtained from the study of words only, or we shall fail to give our children a preparation for "complete living." It is certain that the time spent on real educational handwork is not wasted; the training will give a solid foundation for usefulness in after life.

Having established the claim of handwork to be recognized as an integral part of any system of education, let us now see what "handwork" includes, and how it will tend to procure the advantages attributed to it.

**What Hand and
Eye Training
includes.**

By "hand and eye training" is meant a series of progressive exercises involving the use and manipulation of tools, and providing opportunities for the eye to judge of direction, form, space, contour, etc. The exercises must be so arranged that the operations will not be repeated in such a way as to become merely mechanical; every movement must be *thought-directed*, every successive step must demand continued attention. The materials may be paper, cardboard, clay, wire, wood, metal, etc.; the tools may be pencils, chalk, crayons, compasses, rulers, brushes, scissors, knife, saw, plane, chisel, etc. These are but the means; the end and aim is the *training of hand and eye*, and also of the brain, in conjunction with one another.

Of drawing as a branch of hand and eye training it may not be necessary to speak, though too often the "eye training" is neglected in the struggle to get fine handwork. The tools used in drawing may be chalk, pencil, crayon, or brush, together with ruler, set-squares, and compasses, for "mechanical" or "technical" drawing.

Drawing.

In common with other handwork exercises, the proper manipulation of these tools must be taught, in order to secure the best results and training. But correct manipulation will be of little use unless at the same time the eye is exercised in judgment, so that the lines or masses produced may be in correct proportion. The eye must first be taught to *see* before the hand can *produce*.

Drawing is in itself a manual training, but it has been well observed that "manual training through drawing alone is but work half done: designing, and the working out of the design, are but two parts of one whole; but without drawing, exact and intelligent handwork is scarcely possible."

Drawing is the handmaid of all industrial art, and, as such, it is of the utmost importance that it should be cultivated to the fullest extent. In addition, however,

to this utilitarian value, drawing has a distinct educational value in aiding the formation of those mental and moral attributes referred to previously. It trains observation, which is one of the most valuable and most complex of mental processes; it quickens the power of perception; it gives scope to the inventive faculties better, perhaps, than any other subject; it is the shortest of shorthand systems, enabling us to convey an impression much more quickly than is possible by any system of writing; it is a universal language, understood the wide world over. Among real educational forms of hand-work, drawing must take rank as the most important, because all other manual exercises may be said to be dependent upon it. So universal is the recognition now accorded to drawing as a valuable means of education, both from a utilitarian and an intellectual point of view, that nothing further need be said on the subject here.

"Other Manual Occupations."

There can be no doubt that the value of drawing is greatly enhanced when one or more of the forms of hand and eye training in common use, which utilize other materials and exercise other faculties, are connected with it, thereby giving a completeness and finish to the educational process. For, after all, drawing, especially that branch which deals with outlines only, is but one degree removed from the abstract. When children draw a square, a triangle, or any similar figure in outline, they are very apt to look upon the boundary lines as being the figure, instead of the space enclosed between them. But let the same scholars cut out the shape in paper or cardboard, or let them tint it with colour or make it in clay, in each case rendering the outline merely subservient to the mass, and their conception of the form is true and accurate, and their knowledge of it far more complete. In the earlier stages of hand and eye training this is one of the most important features—the accurate perception and knowledge of form and mass as opposed to mere outline, and the training to look at space rather than at line. By making a single square in paper, cardboard, or clay, young children will get to know more of its properties than by merely drawing it several times. They may place it in any position, twist and turn it at will, but it still remains a square; the alteration in position has not affected the relationship of sides and angles. Similarly with the other right-lined geometrical figures, and with the circle, the ellipse, and the oval. Later on, when the solids come to be developed in cardboard from accurate working drawings, a first-hand knowledge is gained of the properties and proportions of these solids such as can only come through making them.

Yet later, in the woodwork exercises, the "familiarity betwixt mind and things" is still further strengthened, and the utility of "solid" geometry made abundantly clear. Added to all this, there is the training in accurate workmanship and in the use of tools. Commencing with perhaps scissors only, the course of manual work gradually introduces the knife, saw, plane, chisel, brace, spokeshave, etc., all needing greater skill in manipulation, demanding increased attention, and giving greater opportunities for more delicate workmanship and more careful eye judgment. This is *hand and eye* training.

The progress of the work must be gradual. To the child of seven or eight years of age, the cutting of a piece of paper to a definite form is as serious an operation, and

demands as great thought and care, as does the cutting of a piece of cardboard to the child of nine, or a piece of stubborn wood or metal to the pupil of twelve or fourteen. Similarly with a course of brush drawing or of clay modelling: from simple to complex, from easy to difficult, must be the order of procedure. No one should therefore despise the simple brush impression, or the equally simple finger impression in clay work, as foundations upon which to build a solid superstructure.

The Choice of Occupations.

It cannot be too emphatically insisted upon that the mere material—the mere channel through which the training is conveyed—is of infinitely less importance than the training itself. *We are developing faculties, not teaching a subject.* It is not easy to lay down any rule whether this or that subject is the best; this depends upon a variety of circumstances. The children, the neighbourhood, the conditions of school work, and last, but not least, the personal inclination of the teacher, should all influence the choice.

In any case, in order to be educationally useful, every form of handwork must be carefully graduated; it must be such as to demand constant and increasing attention on the part of the pupils, and must train the hand in dexterity and the eye in judgment: the teacher must also know the subject, must believe in it, and must work at it. If these conditions are fulfilled, the result attained cannot fail to be successful.

Different Branches of Work compared.

No one subject is ideally perfect. Clay modelling, for example, trains the eye to appreciate form and mass, and cultivates a fine sense of touch and muscular perception; but it does not cultivate great accuracy, and it lacks the charm of colour. Brush drawing gives exceedingly good hand-training in dexterity and lightness of touch; it cultivates a nice sense of colour and of form; it is an excellent training for the powers of observation, for the development of the inventive faculties, and for the study of nature; but, like clay modelling, it does little to give the skill to work accurately and with precision.

On the other hand, the manual occupations in paper, cardboard, wood, and metal develop the powers of accurate workmanship in the highest degree, from the simple operation of cutting a form in paper to the making of the scoop as a sloyd model, or producing a really good bit of inlay work. They also provide training in the use of a great variety of tools, which in itself is valuable. They do not, however, need such a facile, dexterous, and artistic touch as brush drawing and modelling, nor can they be so closely connected with the study of nature.

Training in accuracy should not, however, on any account be despised. The late Mr. Thring of Uppingham wrote: "The attribute common to all trained workers is accuracy." It has been urged against these subjects that, because they demand accuracy, the work is "mechanical"—that is, done without thought. If this were so, then the subjects would undoubtedly be uneducational; but, as a rule, the use of any cutting tool demands the constant and concentrated attention of the worker, or the work is irretrievably ruined. The operations cannot be performed in a thoughtless way. In clay modelling an error may generally be rectified; in cardboard work a mistake can seldom be put right except by doing the whole exercise over again. Each subject has some one

good feature peculiar to itself which is not possessed by the others. Where circumstances permit, it is best to take two subjects—one from what may be called the artistic side, and one from the manual side. Thus, clay modelling or brush drawing, continued throughout the school, may be worked in conjunction with paper-work for the junior division, cardboard work for the middle division, and woodwork for the upper division, with drawing as the foundation of all. If only one be taken, let it be that most generally fitted to the circumstances of the school.

Whatever be the special subjects selected, “drawing and manual occupations” need at least as careful teaching and as unceasing watchfulness on the part of the teacher as any other of the school subjects taught. He must not fall into the error of thinking that after the materials are given out, the children can do the rest as a “recreative” lesson. It is this method which is answerable for many of the objections formerly urged against hand and eye training. The exercises done were trivial, the result, as might have been expected, was execrable, and thoughtful persons saw at once that such work could not be called educational. Hand and eye training, whether carried on through drawing alone, or through drawing in combination with other manual exercises, necessitates solid work on the part of pupil and of teacher.

It must not be looked upon as merely giving manual dexterity—though this point is by no means unimportant—but also as providing training for the intellectual faculties; for the eye, in judgment of space, form, contour; and for imparting knowledge first hand through things. Whatever, therefore, be the material selected, the exercises given must be arranged in such sequence as to secure this manifold training, which undoubtedly will do something towards preparing our children for “complete living.”

One other point strongly in its favour is its great popularity with the children. They delight to use their hands; the creative instinct is very strong in young children; and it has been abundantly proved that wherever manual lessons are given, the scholars return to their bookwork with renewed vigour.

Objections raised against Manual Training. Of the objections urged against manual work generally, the chief one is that of a want of time—the school time-table being already overcrowded. Without doubt this is a serious matter, but it is no argument for or against the subject. The fact that manual work happens to be the latest development in the educational question has no bearing upon the question of its utility. What would be thought of a manufacturer who, because his factory was full of machinery—the best of its kind when put there—neglected to provide himself with the more productive machines which were afterwards available? He must “keep up with the times,” as we express it, or he falls out of the race altogether. A manufacturer recently said he would take out all his existing machinery and replace it with new, if by so doing he could increase the output five per cent. We can no more afford to do without progress in the educational world than in the commercial world. When a new machine appears in connection with any industry, those interested in that particular industry are generally most eager to test its merits. If it

proves successful, it is soon adopted; if it fails, it is cast aside. We only ask that the same test be applied to manual work. Let the test, however, consist of a fair and real experience of the work.

Writing on this question of time, Dr. Gunn says: "But this training [manual training] is generally dropped, or practically dropped, when children leave the infant school. There is no time for it, we are told. What should we think of a workman who could not find time for sharpening his tools? or of a traveller who had no time to choose the best road? or of a water-carrier who could find no time to stop the leak in his pitcher? And every one who has studied the matter agrees that there is a very serious leakage of the instruction now given in our schools. In some cases the leakage is declared to be so great that, after a boy has been a year or two away from school, nothing remains of what we gave him except the elements of writing and a modicum of the power to read. These are notable exceptions, too: what remains is precisely that in learning which hand and eye were most exercised."

The remedy for an overcrowded time-table should be, not a curtailing of the curriculum, but a lengthened period of school life in which to accomplish the work.

Though manual work has been spoken of as the latest development in the educational question, it is not really so. Pestalozzi and Froebel were strong advocates of it; while Rousseau, over a century ago, wrote: "If, instead of keeping a boy poring over books, I employ him in a workshop, his hands will be busied to the improvement of his understanding." It is this point that most needs pressing home. The education of the hand means a more complete education of the brain. The cultivation of care, observation, exactness, and patience must have a beneficial effect upon all other pursuits.

No one claims—least of all those most interested in the work—that manual training has a monopoly of the good things in education, but simply that on its merits it is worthy to be placed on a level with the literary and scientific branches.

One thought more. Polytechnics and technical schools are springing up on all sides, and scholars must graduate from primary schools to fill them. Should not these scholars be prepared for the manual side of the work as well as for the literary or the scientific?

In concluding this section, one paragraph from the final Report of the Irish Commissioners, giving a digest of the late Sir Joshua Fitch's evidence, may be given, as summing up the situation fairly and clearly. "I think," he said, "that all teachers who have adopted those methods have found that they quicken the general intelligence of the scholars, and at the same time give to many scholars who are not bookish a chance of attaining excellence, and of doing something they can do well. It has a very good influence upon their general training." And after deprecating the exaggerations of enthusiasts who are "disposed to think that the world is going to be regenerated by turning schools into workshops," he added that, "within its proper limits, the carrying forward of some form of manual instruction right through the whole scheme of education up to the secondary school is a step in the right direction, and has done distinct good."



SCHEME OF DRAWING AND MANUAL INSTRUCTION.

WHILE this manual deals only with Stage V., the whole scheme is given for the sake of completeness, and in order that the teachers of this stage may see what has been done before and what has to be done subsequently. The scheme is divided into seven stages as follows :—

STAGE I.

FREE DRAWING.

Simple right-lined forms, and curves in connection with them, drawn on paper or boards with pencil or chalk.

The examples given should be exercises on the square, the oblong, and the triangle, simply divided ; or the representation of objects with which the children are familiar—as a flag, a boat, a house, simple leaves, etc. No meaningless complication of lines should be attempted. The drawing should be as direct and free as the age and capacity of the children will permit. The curves should be simple in character.

[The “free drawing” in this and the succeeding stages may be done either by **freehand** or **freearm**, or, what is better still, by both methods. Each method should assist the other.]

MECHANICAL OR TECHNICAL DRAWING.

- (a) **Simple geometrical figures, including the square, the oblong, the triangle, and other easy forms, drawn with the ruler to various measurements.**
- (b) **Pattern work, produced by repeating some of the units, drawn either in the free-drawing section, or section (a) above.**

No fractions of inches need be given. It will be found advisable to introduce the set-square (45°) as early as possible. The various terms relating to lines—as *vertical* or *upright*, *horizontal* or *level*, *oblique* or *slanting*—and those relating to angles may all be taught throughout the exercises. The “pattern work” is classed as “mechanical drawing” —though it needs also much free drawing—because the “setting out” is best done as a ruler-work exercise. At this stage, too, inch-squared paper may be found very useful and helpful for the exercises in elementary design. Though the free-drawing and the

mechanical section will for the most part be carried on separately—each having a somewhat different aim—yet it will often be found most advantageous to combine ruler drawing with freehand drawing. The character of the examples will depend in a large measure upon the manual exercises that are taken in connection with drawing.

MANUAL OCCUPATIONS.

These should consist in reproducing in a concrete form some of the patterns drawn under the two previous heads, by

- (a) **Paper cutting and mounting,**
- (b) **Modelling in clay;**

or these patterns may be

- (c) **Coloured with chalks or water-colour;**

or the spaces may be

- (d) **Decorated with brush forms.**

Only one, or at most two, of these branches should be taken. Manual exercises are most valuable auxiliaries to drawing, as by them children are enabled to thoroughly appreciate the various forms which they have drawn.

STAGE II.

FREE DRAWING.

Exercises involving the use of more difficult curve elements than those of Stage I., to produce simple natural and conventional forms, and familiar objects.

The curves of the oval and the ellipse may now be introduced, and utilized to represent leaf forms—such as lilac, violet, laburnum, and clover—and simple bud forms; also familiar objects of similar difficulty, and simple insect and other animal forms. Actual specimens should be used as models.

MECHANICAL OR TECHNICAL DRAWING.

- (a) **The simple geometrical figures of Stage I., with the addition of the equilateral triangle, the rhombus, and the rhomboid, and other exercises of similar difficulty, drawn with ruler and set-square.**
- (b) **Pattern work, produced by repeating some of the elements drawn in the free-drawing section.**

The 60° set-square should now be introduced, and the equilateral triangle and various border patterns constructed with it. Some of the objects in the classroom may be measured and drawn full size or half size, etc. The measurements may now include fractions of an inch ($\frac{1}{2}$ " or $\frac{1}{4}$ "). Greater use will be made of curved forms in design.

MANUAL OCCUPATIONS.

These will again consist in reproducing some of the exercises done in the two previous sections, by means of

- (a) **Paper cutting and mounting,**
- (b) **Modelling in clay;**

or decorating the spaces with

- (c) **Tints of colour,**
- (d) **Brush forms.**

The two former are mainly **constructive**, the two latter **decorative**; and if two of these occupations are taken, it will perhaps be best to select one from each group. It is better, however, to take one occupation and do it thoroughly, than to attempt two and do them superficially. The manual occupations serve to round off and complete the work begun in drawing.

STAGE III.**FREE DRAWING.**

- (a) **Easy natural forms—simple leaves, flowers, insects, and familiar objects.**
- (b) **Simple conventional ornament.**

The complete forms of the ellipse and oval will give the main basis of the exercises worked in this stage. The use of these two fundamental forms is of such frequent occurrence in the higher stages, that a thorough grounding in them is necessary here. An almost infinite number of conventional, natural, and familiar forms take one or other of these shapes. Throughout the entire course natural specimens should be used as models.

MECHANICAL OR TECHNICAL DRAWING.

- (a) **The geometrical figures of Stages I. and II., with the addition of the hexagon and the octagon.**
- (b) **Pattern work or simple design, produced by utilizing the forms studied in the free-drawing section to decorate the spaces drawn under section (a).**

Both the 45° and the 60° set-square should now be used, and exercises in constructing borders, making figures, and working from actual measurement should be done. Many of the spaces so produced should then be filled in with suitable forms drawn by freehand, with brush or pencil. This gives a practical utility to the ruler drawing. If possible, construct the equilateral triangle, hexagon, and octagon with compasses as well as with set-squares.

MANUAL OCCUPATIONS.

As in the two previous stages; but as the drawing is now chiefly of curved forms, the exercises worked out in paper will involve curve-cutting, and the spaces tinted with colour or decorated with the brush will also be bounded by curves. To these may now be added, as another alternative occupation,

Elementary modelling in paper or cardboard.

Only the very simple elements can, however, be attempted. The geometrical forms—square, oblong, triangle, hexagon, octagon—may be cut out and the edges bound; or such easy models as the cube, the square prism, a simple tray, and other familiar objects may be made in paper, or in very thin cardboard.

STAGE IV.**FREE DRAWING.**

- (a) From nature—leaves, buds, flowers, fruits, shells, etc.
- (b) From objects—hoop, cylinder, and cone; and simple objects based upon them.
- (c) From flat examples—to demonstrate principles; to show good execution and good form; to test judgment of proportion, etc.

In (a) and (c) attention should be paid to analysis, growth, etc. In Section (b) the principles are best taught from the geometrical models, and then applied to common objects. The power to judge correctly the ellipse lays the foundation for drawing all cylindrical and conical objects. Only simple forms in upright positions should be attempted. Section (c) should only take up a small portion of the time.

MECHANICAL OR TECHNICAL DRAWING.

- (a) The use and development of all the geometrical figures practised in the previous stages, as bases for design.
- (b) Simple scales and drawing to scale. [Optional for Girls.]

It would be of great advantage if compasses could be used generally in this stage, both for the work of Section (a) and Section (b). In Section (a) the spaces required may often be more easily done with compasses than with ruler and set-square, while use may also be made of the circle, the semicircle, etc. In scale drawing, too, the required distances are much better measured with the compasses; calculating them on the ruler is a slow process. The whole of the exercises in scale drawing should be from actual measurement of objects. Nearly every classroom will furnish a sufficient variety of objects for a whole year's course. Start with a single page of the drawing-book, and draw it to half scale (the pupils will see it cannot be drawn full scale); then take two pages, a black-board, a picture with the cord, a slate, a door, a window, a fireplace, an envelope (note size and foolscap size), the top of the desk, a box with lid open (two views), a tumbler-glass, a flower-pot, a pail, an inkwell, a reel, the lock on a room door and on a cupboard door, a plan of the room. Here are twenty exercises which will give plenty of practice and will need a great variety of scales. Some of the suitable exercises may also be worked out in isometric projection.

MANUAL OCCUPATIONS.

- | | |
|--------------------------|--------------------------------------|
| (a) Cardboard modelling. | (c) Flat tinting with water-colours. |
| (b) Clay modelling. | (d) Brush drawing. |

These manual occupations now begin to assume a somewhat changed aspect. They are so interwoven with and dependent upon drawing that it becomes difficult to separate them. For example, cardboard modelling, which is by far the most suitable occupation for boys, may be intimately linked with scale drawing, inasmuch as the development of the ordinary geometrical models—cube, square prism, hexagonal prism, etc.—may be drawn to scale from the large set of drawing models. Again, the flat tinting and brush drawing may be taken as a subdivision of Section (a) in the mechanical drawing. It seems that, so far as the “manual training” side is concerned, the best course for boys would be paper-work in Stages I. and II. (age 7 to 8), cardboard-work in Stages III. and IV. (age 9 to 10), with woodwork afterwards, especially if brush drawing or modelling could be done as a section of drawing. For the girls a somewhat similar course could be followed, except that cookery, laundry, or housewifery would take the place of woodwork. Girls also have in needlework a continuous manual occupation.

STAGE V.

FREE DRAWING.

- (a) From nature—leaves, buds, flowers, fruits, shells, etc.
- (b) From objects—simple rectangular forms: cube, square prism, boxes, books, drawers, etc.
- (c) From flat examples—to demonstrate principles; to show good execution and good form; to test judgment of proportion, etc.

In Section (a) brush drawing may be taken as an alternative to freehand outline. Similar examples would be drawn whichever medium was employed; the only difference would be using the brush in the one case and the pencil in the other. Many exercises, too—such, for example, as the Greek honeysuckle border or the Egyptian lotus border—may have the leading lines lightly suggested in pencil, and then the full forms drawn freely with the brush, thus combining both pencil drawing and brush drawing. Further, the object drawing should give sufficient practice in pure outline, either in pencil or in chalk. Sections (a) and (b) are much more important than (c).

MECHANICAL OR TECHNICAL DRAWING.

- (a) The construction of figures with ruler and compasses, which may afterwards be filled in with freehand or brush-work ornament.
- (b) Geometry and scale drawing so far as is necessary for the first year's course in woodwork, including simple plans and elevations and isometric projection. [For Boys only.]
- (c) Plane geometry, including the division of lines and of angles; the construction of triangles, quadrilaterals, and easy polygons.

Section (a) should be worked in connection with Section (a) of the free drawing, and may include flat tinting. Sufficient geometrical work may possibly be provided by Section (a), without taking (c) at all. Where no provision is made for woodwork, Section (b) may

be applied to the development of surfaces for **cardboard modelling**, or **clay modelling** may be continued.

MANUAL TRAINING.

First year's woodwork course.

STAGE VI.

FREE DRAWING.

- (a) From nature—leaves, buds, flowers, fruits, shells, insects, etc.
- (b) From objects—further circular and rectangular objects, more difficult in shape, and placed in more difficult positions.
- (c) From flat examples—to demonstrate principles; to show good execution and good form; to test judgment of proportion, etc.

Freehand outline and brush drawing may again be taken as alternatives, for the reasons formerly stated. The natural forms should now include the drawing of simple sprays of foliage, or groups of fruit; and perhaps very simple renderings of birds, insects, animals, and other familiar objects.

In Section (b) groups of two or three very easy models may be given; but the positions, though more difficult than in Stage V., should still be simple. The vases should stand upright. The broad effects of light and shade may be added.

MECHANICAL OR TECHNICAL DRAWING.

- (a) The construction, with ruler and compasses, of figures which may afterwards be decorated with freehand or brush-work ornament.
- (b) The geometry and scale drawing which is necessary for the second year's course in woodwork, including plans, elevations, and simple sections; isometric projection. [For Boys only.]
- (c) Plane geometry, including the construction of polygons on a line or in a circle; simple problems on tangents; similar figures.

Sections (a) and (b) again may probably provide sufficient geometrical work without (c) being attempted. As in Stage V., Section (a) is really auxiliary to Section (a) of the free drawing, and will necessitate a constant and familiar use of compasses and set-squares to produce suitable geometrical figures.

MANUAL TRAINING. [Boys only.]

- (a) Woodwork, second year's course; or metal-work, first year's course.

Where neither of these subjects is provided for, the **cardboard modelling** or **clay modelling** may be continued.

STAGE VII.

FREE DRAWING.

- (a) Drawing with pencil, chalk, or brush from natural forms and from the cast.
- (b) Adapting details derived from Section (a) to form simple pattern.
- (c) Groups of models rather more difficult than those suggested in Stage VI.

Some very good exercises in brush drawing may be given by taking a cast of ornament in low relief, indicating the leading lines in pencil, and then drawing the full forms freely with the brush. The examples should be chosen so that the pupils may obtain some knowledge of the various styles of historic ornament. The decorations of Greek and Egyptian vases abound with typical brush forms.

In Section (b) interesting little groups of science apparatus—such as a tripod, a retort, and an evaporating dish; a Leyden jar, a Florence flask, and a mirror—may be given; or, from the workshop, a glue-pot, with an axe or a mallet. The broad effects of light and shade, in pencil or colour, may be added.

MECHANICAL OR TECHNICAL DRAWING.

- (a) The construction of geometrical figures to form the bases of designs.
- (b) All working drawings connected with the current course of manual training. [Boys only.]
- (c) Plane geometry, including the inscription of triangles, squares, and circles within other figures, and circles about other figures; problems relating to lines and circles; the ellipse.

As in Stage VI., Section (a) of the free drawing and Sections (a) and (c) of the mechanical drawing contain much work in common, as the freehand and brush-work ornament often requires a geometrical basis.

MANUAL TRAINING. [Boys only.]

- (a) Woodwork, third year's course, or metal-work, second year's course.

[Stage VII. would be suitable for higher grade and secondary schools.]

This completes the full scheme. It is not suggested that the whole of it can be carried out in every school. The amount which can be done depends upon a variety of circumstances; there is sufficient here for the best.

It should be noted that from Standard IV. onwards the syllabus for girls is considerably lighter than that for boys, the technical drawing being nearly all omitted.

Though the various sections are here sharply defined, it will be shown in working out the scheme that they are all closely interwoven, not only with one another, but with other subjects of instruction.

The several stages *may* be taken to coincide with the present standards, but this is not necessary; it will depend entirely upon the varying conditions under which the subject is taught.

Though no specific mention is made either of **design** or of **memory drawing**, both these important branches will be dealt with in working out the course.



THERE is nothing in the nature of drawing that demands for it different treatment from that given to the other subjects of the school curriculum. It can be taught as systematically, as logically, and as gradually as reading, writing, arithmetic, or grammar. Yet it is often looked upon as needing some special talent. This is probably due to the restricted sense in which drawing was formerly considered—namely, in its relation to fine art, instead of as a useful factor in general training. In every class the same variation exists with regard to drawing as to other subjects. A few scholars are very good, and seem to take to it intuitively; a few are very poor, and seem to make little or no progress; while the bulk of the class show as fair an average as in other work.

By *free drawing* we mean the power to draw freely, without the aid of instruments of any kind. It may be done either by “free-hand” or “freearm”—with pencil, pen, charcoal, brush, chalk, or any other medium. The aim is the same whichever method may be employed—namely, to train the eye to see correctly, and the hand to reproduce what the eye sees. Eye training cultivates the power to secure *form* and *proportion*; hand training gives *skill in execution*. Good drawing depends upon the proper cultivation of both these faculties, though correct eye judgment is really of greater importance than skill in execution; for no matter how beautifully lines may be drawn, they are of little value if they give us a wrong idea of the form. We can, however, excuse the lines being a trifle faulty if they give us a correct conception of the shape and proportion of the object.

In all drawing, whether from nature or objects, from the cast or from the flat, three separate faculties—distinct yet interwoven—are put into operation. First, and most important, comes OBSERVATION. This implies close study of the form we wish to reproduce; it necessitates a careful *comparison* of the various parts of the object—its contour, shape, character, colour, etc. The mere physical act of looking is not enough; it demands the *intelligence* as well—we must think all round the subject, as it were. One cannot be too emphatic on this point, nor overrate its importance; it should be cultivated to the fullest extent at every stage. Secondly, there is RECOLLECTION, which is almost the direct outcome of careful observation: the form must be impressed upon the memory. This implies time; and it is well to remember that it takes just as long to commit a simple form to memory, with the idea of reproducing it, as it does to learn off by heart a verse of poetry or a list of dates. In ordinary

line drawing these two phases—observation and recollection—take up the major portion of any drawing lesson. If they were more thoroughly done, there would be far less need of the duster or india-rubber to rub out lines drawn hastily without sufficient previous study. Lastly comes REPRODUCTION, or expression—the giving out, as it were, of what the mind has taken in through observation. This implies good command over the materials being used—pencil, pen, chalk, brush, etc. Such manual dexterity can only come by practice and precept. It is for this reason that drill exercises are suggested, so that the manipulation may be almost automatic; that good printed examples should be sometimes placed before the children, so that they may learn the convention of expression, that they may set a high standard of execution before them, and have some appreciation of “quality of line,” “simplicity of treatment,” and other things which all go to make up a good drawing.

Correctness in proportion is more difficult to attain than skill in execution. Both scholars and teachers feel this; and in order to produce a drawing somewhat like the original model, various expedients—such as ruling and measuring the construction lines, or squaring the paper—are resorted to. This should never be done. The very commonness of the errors shows how widespread the weakness is. Practice alone can overcome it; therefore see that the pupils have plenty of practice, and let it be free-eye work as well as freehand or freearm work. It does not matter how simple the beginning is—be it but to judge whether a line is quite upright or quite horizontal, or to locate the position of a simple point—so long as the eye is being trained in conjunction with the hand. Drawing is not a matter of being able to take a pencil or chalk and produce off-hand a series of isolated, graceful lines; it is the drawing of lines to represent definite form and to enclose definite spaces. The realization and conception of these spaces is the work of the eye. Too often the eye-work is omitted altogether. An example is placed before the class, and within the briefest space the scholars are actually drawing it, no time being taken to estimate its general shape and proportion, and the best method of setting to work to secure these; or, on the other hand, a long, wordy explanation is given, and all the various points painfully located,—which takes up the major part of the lesson. In neither case, however, is true eye judgment or true appreciation of space cultivated.

When a copy or an object is to be drawn, the first thing to be done is to study its *general proportions*—length compared with width, where the greatest breadth is, and such like. Two or three questions put to the class, occupying perhaps five minutes at the outside, will generally be sufficient for this. Next should come the method of “setting out” by construction lines. These should always be as few as possible, and should not be taught by the teacher in every case, but should be sometimes suggested by the pupils. In this section the hand-work is comparatively unimportant, the eye-work all-important.

Next put in the main lines. These, again, require very careful eye judgment, for it is here that the general proportion of the drawing must be secured. Lastly, where the example demands it, fill in the details. Here, perhaps, the hand-work is equal in

amount to the eye-work ; it has been far less in the other stages. Briefly, this gives the method of procedure for every drawing, from a simple leaf form to the human figure : first, a general survey of the form, and a careful comparison made between the various parts ; next, the setting down of the fewest possible lines to indicate this proportion (this is mainly eye-work) ; lastly, the filling in of the details. The practice of building up an example, a line at a time, from the teacher's copy on the board, is bad in principle. The pupils never have the chance of seeing the thing as a whole. The complete example should be before them at the beginning, so that they may see the reason for every step.

It should be remembered that all drawing is memory drawing
Memory Drawing. at longer or shorter intervals, since one cannot be looking at the example to be drawn and at one's drawing at the same time. Learning the correct pitch or curvature of a line takes a certain amount of time, just as learning by heart a verse or a sentence. One cannot look at a more or less subtle curve for about the space of a second and then hope to reproduce it accurately ; it needs close study and careful observation. The time spent by the eye in learning the form will be at least equal to that taken by the hand in drawing it, and in many cases more.

Systematic exercises in memory drawing should form a definite part of every stage. Bear in mind, however, that it is necessary to learn the forms before any attempt is made to draw them. Asking children to draw objects selected at random is no test of memory ; only after forms have really been studied is there any hope of success. An object may be placed before the class, say for five minutes, during which they study it closely until its shape is impressed on the memory. It is then hidden away, and the scholars try to draw it. Bring it again into sight, and carefully compare the drawing with the original. Remove the object again, and make another drawing if necessary. Another plan is to give the children some outside object to study, such as a street lamp, the top of a railing, or any other well-defined familiar form, telling them that they will be called upon to draw it from memory at the next lesson.

New Conditions of Work. Under present conditions, the practical work in school can be pursued on much freer lines and by more educative methods than formerly. So great is the change that there is a danger of the pendulum swinging too far to the other side, and it is necessary to put forth a word of warning. Because, under the old *régime*, the children of Standards I. and II. were tied down to a dreary two years' course of straight lines only, it must not be supposed that under the new conditions the straight line can be dispensed with altogether. It is a necessary element in drawing, and is, indeed, the most natural beginning. As far as the mere effort of execution goes, the straight line is perhaps more difficult to produce than certain curves, but in the matter of "eye judgment" it is certainly the simplest element. A curve can have varying degrees of flexure, which require far more "eye training" to judge correctly than does the simple element of straightness. It cannot be too clearly realized that two distinct elements are necessary to make a successful drawing. There must not only be good lines, but these must also be placed in the proper position, be of the right curvature, and enclose the correct spaces. Facility of execution is the result

of hand training ; correctness in judgment is the result of eye training : both must grow together.

The error that was made under the old system lay, not in selecting the straight line as the starting-point, but in retaining it exclusively for so long a period, and in persistently neglecting its utility for representing objects with which the children are familiar. It is here that the opportunities of the present freedom can be made most use of. In place of meaningless "figures," the very earliest exercises are drawings made from the children's surroundings, such as printed letters, a picture, an envelope, a flag, a slate, and many other things that may be represented by straight lines. Then, after a few weeks' practice, simple curves can be introduced, and the drawing of easy leaf, bud, and other curved forms attempted. These, in turn, pave the way for more difficult natural forms, as the eye becomes trained to see them, and the hand trained to execute what the eye sees.

In the eagerness to be rid of the old system, there has been a tendency to search for a royal road to success in drawing. There is none. Patient plodding, methodical work, ceaseless watching, are as necessary to-day as formerly. The fundamental pedagogical maxims, "known to unknown," "simple to complex," have not been swept away by the substitution of inspection for examination. Drawing, whether it be of conventional forms, of natural forms, or of design, whether by freearm or freehand, whether with or without the ruler, must be carefully graduated and systematically taught if success is to be assured. Without doubt, the way can now be made far more pleasant than it formerly was. By drawing examples which are interesting and familiar, by the addition of colour, by simple design, the child's activity and interest are stimulated and quickened to a surprising degree. Teacher and pupil alike gain enormously by this more rational method. Neither need the pupil's own spontaneous work be destroyed. Careful tuition and training should give great encouragement and stimulation to his imagination, and greater strength and skill to represent his ideas.



STAGE V.

THE scope of the work widens out considerably in this stage, and there is a much larger field from which to select suitable material. Indeed, it is quite impossible to exhaust all the natural and familiar forms which may be obtained. The examples given only touch the fringe of what is really available. It is, of course, just as necessary as ever to graduate the exercises carefully. Much harm has been,

Scope of Stage V.

and is still being, wrought by giving children exercises that are altogether beyond their capacity. Select examples that they can be expected to do really well, so that you may adopt a high standard in judging the work; such examples as they can understand, and express in an intelligent manner as the result of their previous training. Complicated sprays of foliage, flowers difficult in structure or with excessive detail, are altogether out of place here. Gradual, continuous, but sure progress should be aimed at. Exercises may be obtained from three sources—namely, from nature, from objects, and from the flat. Plates I. to IV. suggest many examples for the first, and page 29 shows some leaf forms suitable for this stage; V. to VIII. give suggestions for the second; and the large sheets published with this handbook supply the third. Each section has its particular use and advantages; they should, taken together, form a complete all-round training.

It is not advisable, even in this stage, to suspend entirely all
Drill Work. the drill work which is essential to good manipulation, but it will occupy a much less important place, while eye judgment and the power *to see* will be treated as relatively more important. There is sometimes a tendency to belittle hand skill, saying it is of no consequence. But good technique is never unimportant, whether in fine art, in music, in games, or in ordinary school drawing. We cannot afford to ignore the *craft* while teaching the *art*. "The training of the observation, and the facility to draw, must go hand in hand; they cannot be separated. The latter is the outcome of the former." A glance through Plates I., II., III., and IV. will show this. Not only are the examples themselves more difficult than those given for Stage IV., but the lines composing them are more subtle in character, thus taking the pupils a step further both in hand and eye work. Be quite sure, however, that the drill work really secures *free movement* of fingers, wrist, or arm, as the case may be.

LEAF FORMS SUITABLE FOR STAGE V.



ELDERBERRY



VIRGINIA CREEPER



BRYONY



LADYS MANTLE



RASPBERRY



BERBERIS



SYCAMORE



HAWTHORN



BUTTERCUP



HOP



OX EYE DAISY



DAHLIA



POPLAR

None of the examples suggested should take more than an ordinary lesson, of fifty minutes to an hour, to complete. Do not make the mistake of teaching the drawing a line at a time. At this stage the pupils should be able to follow the teacher's directions at least as far as

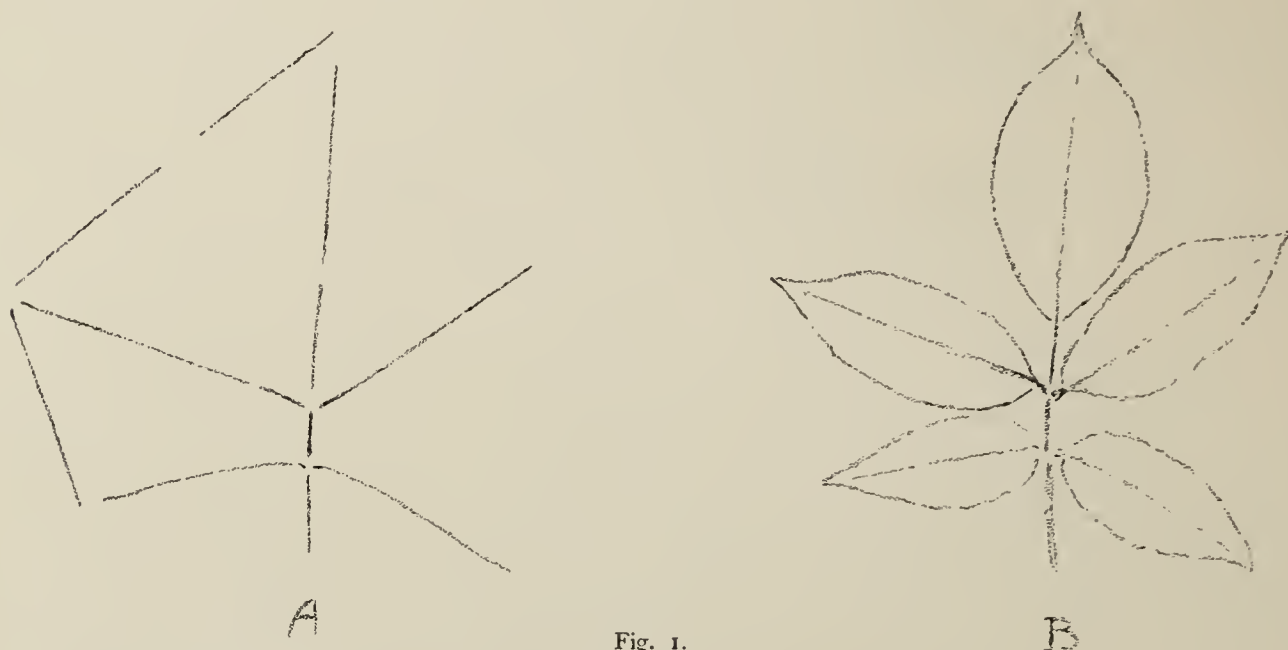


Fig. 1.

the "first stage." Take the leaf of the elderberry, shown on the previous page, as an example. Pin up a good large specimen on the blackboard, and let the class study it carefully for a time. Make a sketch similar to Fig. 1 A, to suggest the direction of the stem and the midribs of the leaflets. These lines should be drawn with the pencil held like Fig. 2. It is of the utmost importance that they should be correct, as far as direction and spacing are concerned. Further lines *may* be lightly drawn, as suggested on the left, to see that the complete mass has been correctly judged. Let

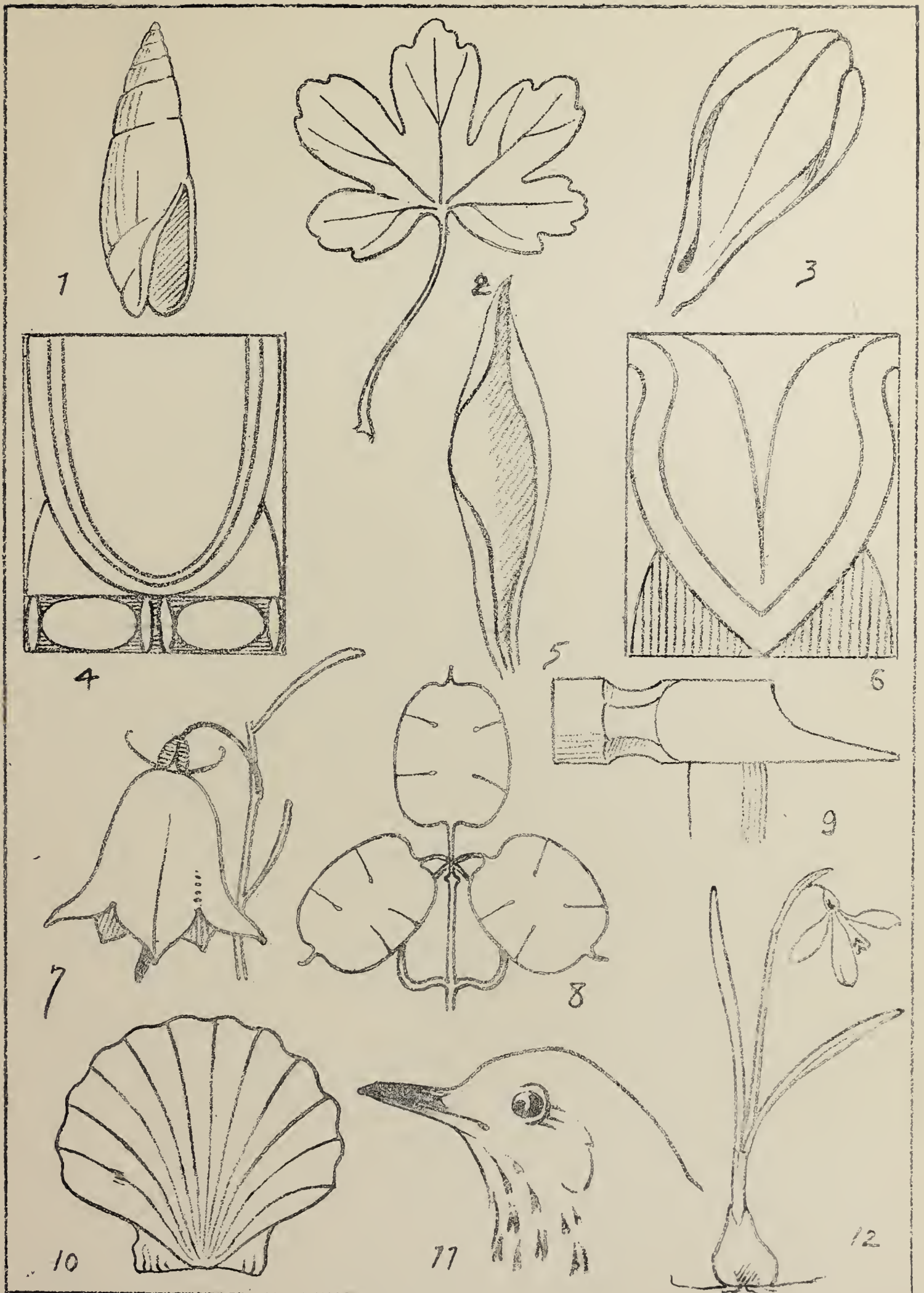


Fig. 2.

the scholars now draw so much in their books. Test the work carefully, and if correct, proceed to draw the separate leaflets (Fig. 1 B). Thus two breaks or stages would be quite sufficient for an example of this kind, even in a demonstration lesson. The fine serrations are not shown, as they would be invisible to the scholars from any distance away. The edges, however, are not made hard. There is enough variety to suggest the serrations. Having taught the principle by means of such a demonstration, the

scholars should at a subsequent lesson be tested to see how far they have grasped the proper method. Obtain a sufficient number of similar leaves—such as the Virginia

PLATE I.



Stage V.]

FREE DRAWING.

[First Period.



Fig. 3.—Oriental plane leaf. Photographed from Nature.

be followed in drawing simple sprays, such as Figs. 1, 10, and 11 on Plate IV. The examples on the large sheets are also intended to explain general principles. On Sheet I., for example, the crocus

creeper, raspberry, berberis, etc.—to give one to each pupil, or one between two, and let them endeavour to draw the leaf entirely on their own initiative, but proceeding according to the method above. Watch the result, and if the pupils fail in any important points, another class demonstration must be given.

Precisely the same principle must

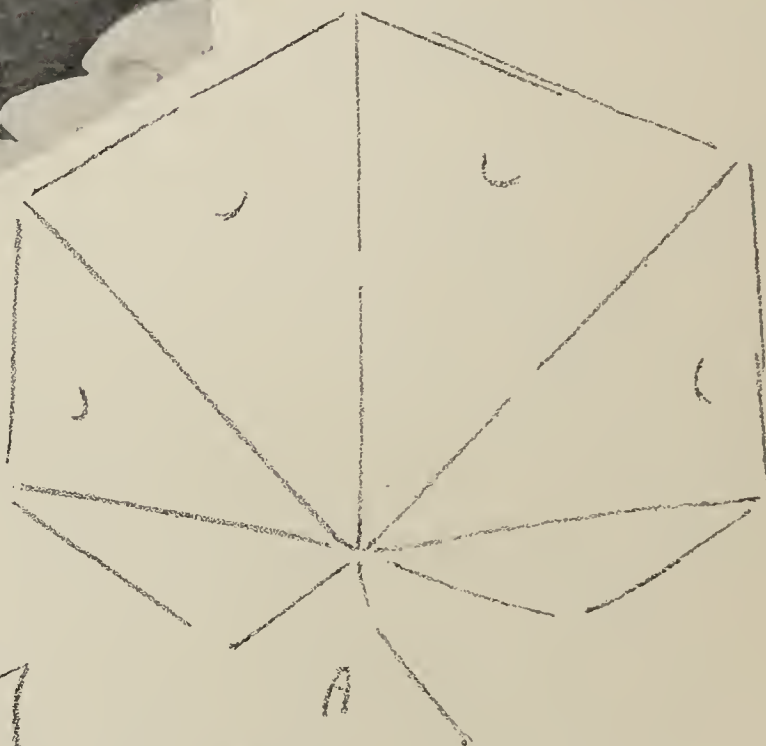


Fig. 3.—First stage.



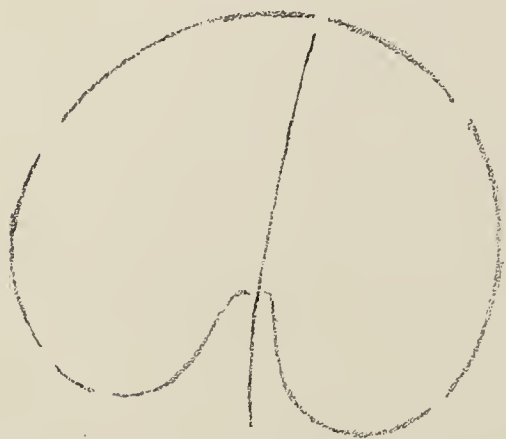
Fig. 3.—Finished stage.

is shown. It would be scarcely possible to give a class demonstration from a natural specimen, but after having studied and drawn that given on the sheet, an actual specimen may readily be attempted.

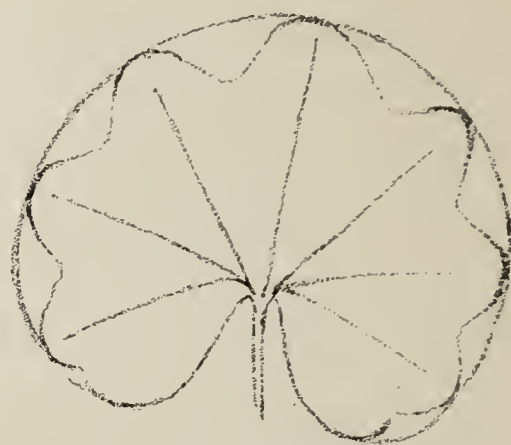
The method of procedure in the case of leaf forms like the maple, bryony, sycamore, etc., is practically the same as for



compound leaves, except that the main veins all radiate from a point. Procure a good large leaf, such as that of the oriental plane, and use it for a class demonstration. Draw the principal veins first (Fig. 3 A), noting particularly the angles between them, and also their relative lengths. This is almost the only way to secure correct proportion. Light suggestive "containing" lines may be put in if it is thought advisable, but they are not



A.—First stage.



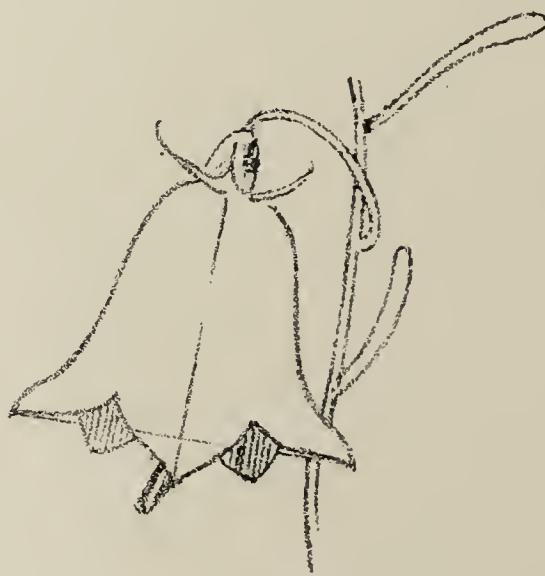
B.—Second stage.

Fig. 4.

absolutely necessary in this case. The main object of this first stage is to get the drawing right in proportion—in bulk, as it were. It takes no cognizance of minor details—small veins, serrations, spots, etc.—and yet is really the most important stage of the work. If this part is wrong, no amount of work added subsequently, however careful it be, can atone for it. Yet, strangely enough, this portion is often neglected, and the attention



A.—First stage.



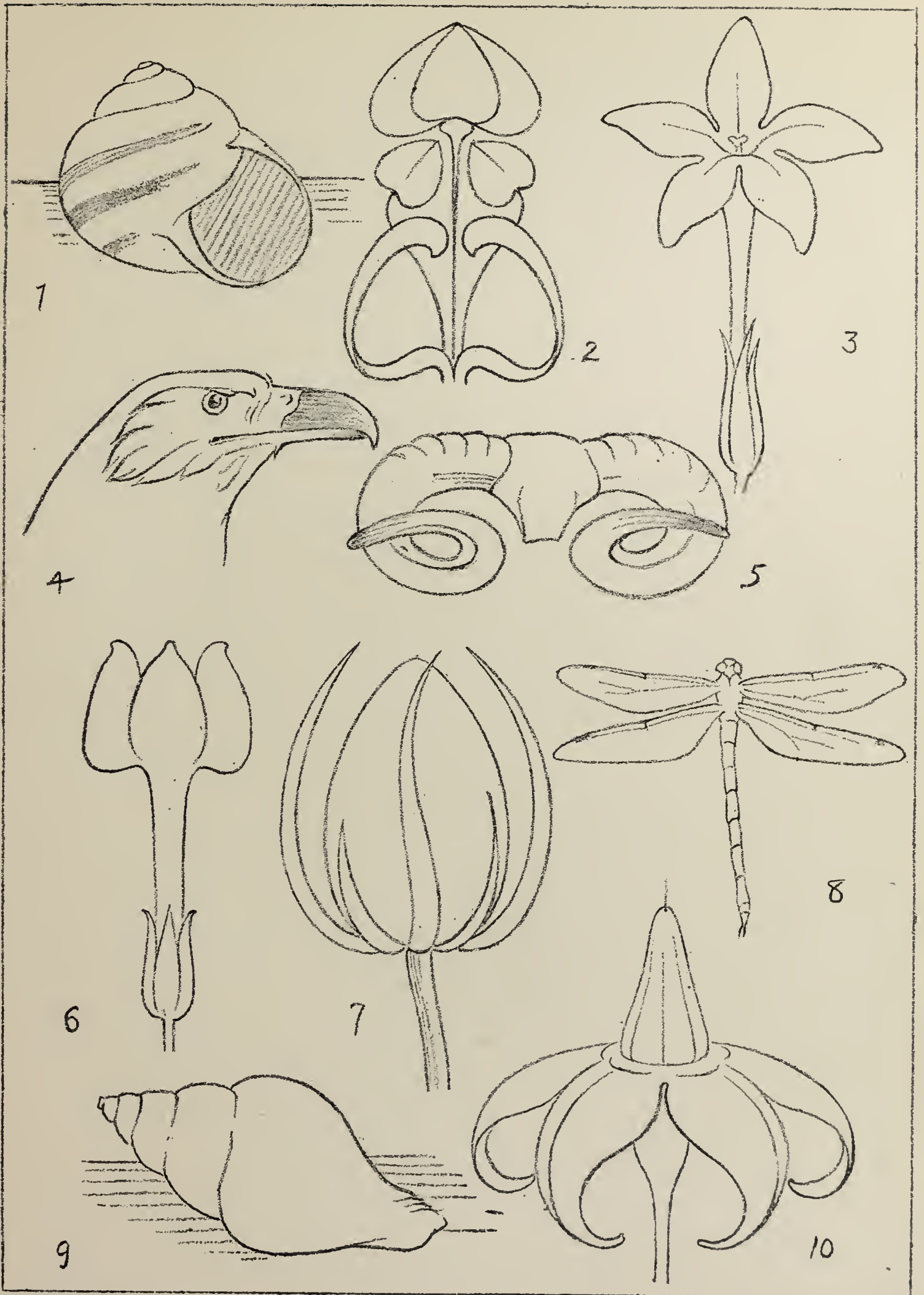
B.—Second stage.

Fig. 5.

concentrated on minor, unimportant details. Fig. 3 B shows the finished sketch. Leaves of the sycamore, bryony, hop, etc., would be done in a similar way.

Leaf forms, or other natural objects which are fairly regular in shape—such as the lady's mantle, the leaflets of the hawthorn and buttercup, the scallop shell—are perhaps best drawn with a "containing line." The "first stage" in drawing the lady's mantle, for example, should be like Fig. 4 A, the second stage like Fig. 4 B. Similar principles

PLATE III.



Stage V.]

FREE DRAWING.

[Third Period.

must be observed in drawing flowers, shells, insects, etc. The first step is to get, by light suggestive lines, the proper proportion and "swing" of the drawing. Once having secured this, the details fall easily into their places. Fig. 5 shows the first sketch and the finished drawing of the harebell, Plate I.; Figs. 6 and 7, the first sketches for the scallop shell and butterfly. Many other suggestions explaining similar principles are given on the large sheets.

When forms requiring new methods are first introduced, class lessons are necessary to explain the underlying principles, and careful demonstrations should be given in order that the scholars may thoroughly understand them. It is equally important, however, to see that the scholars, when they understand the principles, put them into practice. This can only be done by throwing them on their own resources, by giving them similar examples to draw for themselves without any help from the teacher. Of course if the result is a failure, as it sometimes will be, the teacher must come in again and again to set the pupil right. No good can come by repeatedly doing things wrong and making

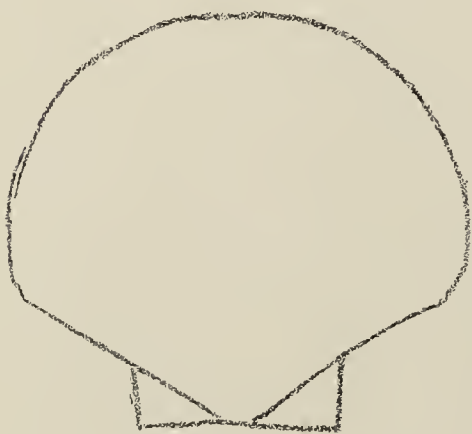


Fig. 6.—Scallop shell. First stage.

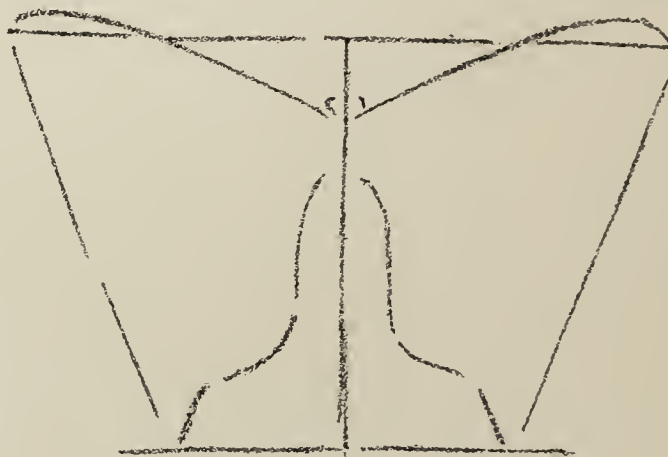


Fig. 7.—Butterfly. First stage.

no effort to put them right. The effort to put them right is often the truest education. The besetting sin of all "nature drawing" is the tendency to be satisfied with a nice-looking drawing, however unlike the original it may be.

Give the scholars individual examples to draw from, but see that they draw them correctly. The exact length to which they may go depends often upon the time allowed and on the capacity of the scholar. Be sure, however, to secure accuracy at every stage. See first that the main outline is correct in shape and proportion, then proceed to the next important features, and lastly to the minor details. Whatever is done, let it be well done. One frequently sees the network of veins in a leaf expressed by a number of wiggling lines, not having even a remote resemblance to those in the natural specimen. Better far that just the main veins had been drawn with absolute fidelity to nature. The same thing occurs with the marking on shells and such like. By all means let the pupils carry their drawings as far as they are able, but insist on accurate observation and expression at each step.

What is true of the natural form is also true of ornament, and the method of working is the same in either case.



Ornament should form at least some portion of every drawing scheme. By this means the scholar learns to appreciate beauty of line and form, symmetry of arrangement, and simplicity of treatment. Individual natural forms are oftentimes not beautiful in themselves, neither are many of the common objects of everyday life suggested for object drawing. Therefore the pupil who draws these, and these alone, is neglecting one important phase of the work. By-and-by he may, out of the sum of his knowledge gained by drawing many natural forms, evolve beautiful forms for himself.

Further, the drawing of ornamental forms, in addition to cultivating a sense of refined beauty, gives considerable skill in technique. The long sweeping lines required demand greater hand skill, and in many instances keener eye judgment, than the short broken lines which go to make up natural forms.

Examples of ornament are given on the large sheets—both in outline and colour—either purely conventional, or ornamental renderings of well-known natural forms.

The plates suggest the character of the examples which may be attempted at this stage. The illustrations are of no intrinsic value, and are not intended to be used as copies either by the teacher or the children. They are mainly simple renderings of natural forms, showing as much detail as will generally be found possible to put in at this stage. As far as these natural forms are concerned, some little forethought is always necessary to provide them; but every school—even in the heart of towns—can always get an adequate supply by a little management. For instance, such leaves as the elderberry, lady's mantle, raspberry, blackberry, maple, plane, berberis, poplar, hawthorn, and many others, can usually be had in superabundance in autumn time. Gathered dry—say, at the end of the summer holidays—and placed between the leaves of old readers, or any other books, they will be ready for use when required. If fifty or sixty be gathered, it allows a margin for spoilt ones. Then, again, seed vessels, samaras, poppy heads, broom pods, and such like, will keep almost any length of time; similarly with shells—the cockle, whelk, scallop, snail, and winkle.

Some natural forms are more ephemeral, and more local too. The harebell, snow-drop, dielytra, narcissus, tobacco plant, monkshood, and pea pods are in this class. They must be drawn in season, or not at all. Neither is it easy for town schools to obtain them in sufficient quantities. The same holds good with respect to the head of the thrush (Plate I.), the cat, parrot, butterfly, sea gull, dragon fly, and water beetle. These must be drawn from the school museum or the town museum. Again, the simple sprays of laurel, ivy, and oak, suggested on Plate IV., though durable enough for a week or two, are rather difficult to obtain in quantities sufficient for the need of large town schools. In many places, however, the public parks supply a goodly number to surrounding schools, and thus the difficulty is surmounted. Winter buds, especially the horse-chestnut and sycamore also make excellent studies. Indeed, there is no lack of material available, only it requires forethought to provide it; and these pages are intended to assist teachers in making up a list of what they require. The list will naturally vary with the surroundings. A country school will scarcely need to collect leaves to dry them; there is generally enough growing material at hand. Schools by the seashore will probably get a greater variety of shells,

and do more studies like Figs. 5 and 6, Plate IV. Conventional ornament (such as Figs. 4 and 6, Plate I.; Fig. 7, Plate II.; Fig. 2, Plate III.), or ornamental renderings of natural forms (such as Fig. 8, Plate I.; Figs. 3 and 8, Plate II.; Figs. 5 and 10, Plate III.; Fig. 9, Plate IV.), will be drawn from a cast or photograph, from a printed example like the large sheets, or from the teacher's copy on the board.

An endeavour has been made to open up all avenues from which suitable material may be obtained, rather than to make out a set course of definite exercises. The pages of brush drawing and clay modelling will no doubt furnish further suggestions if they are needed.

It matters little what is being done, or from what source it is obtained, so that the exercise is within the child's capacity, and yet extends him sufficiently; and that constant care is taken to see that the faculties of *observation*, *recollection*, and *reproduction* are all being equally and harmoniously trained.

Principles should be demonstrated from the large sheets or from large natural specimens, followed by practice in drawing individual examples.

A good HB pencil is most suitable for the drawing of this stage. Broad gray lines, with the vigour that comes from free sketching, are better than the fine feeble lines which result from cramped handling. Though "lining-in" after the old-fashioned method is not good, yet drawings should always be made presentable by a reasonable amount of finish. Construction lines should be removed, ragged portions cleaned out and replaced by a clean line, until the whole drawing presents one firm, continuous line, sufficiently strong to show clearly the form, but not dug into the texture of the paper until the mark is plainly visible on the reverse side. The drawings on the large sheets show the quality of line that should be aimed at. Always try to preserve the open grain of the paper as seen there. These things seem comparatively unimportant, but they are the "trifles that make perfection."

Recreative Drawing.

It will be admitted that any systematic course such as this must fail, in a measure, to develop individuality. Therefore every encouragement should be given to spontaneous drawing—that is, drawing to which children take a fancy, and in which they are absorbed. Some elect to draw horses, some soldiers, some landscape, some design, and so on. If these crude efforts—no matter how poor they may be—are encouraged and sympathetically criticised, a great amount of good may be accomplished. Working through a systematic course is in no way antagonistic to this self-expression through drawing; indeed, the control and discipline of the one acts as a useful foil to the oftentimes extravagant freedom of the other.



DRAWING FROM OBJECTS.

Rectangular Forms in Simple Positions; the Cube, Square Prism, Triangular Prism, and Square Pyramid; Common Objects based upon these Forms.

AFTER a long and varied experience in teaching drawing, I know of no phase of the subject more difficult to teach than that we are now entering upon. Of course it seems easy enough when one can do it, but it certainly is not easy to teach, especially to large classes.

For one thing, there can be no collective class-teaching in the ordinary sense of the term. Every child has a different view of the object. In drawing the round objects suggested for Stage IV., it was shown that up to a certain point the whole class had similar drawings. But in these rectilinear forms each drawing will vary slightly, and each member of the class must study the form for himself.

There is greater apparent change, too, in these right-lined objects than in circular models, and the shape of the drawing is further still from the real form. All these points tend to make the work more difficult, and they all need to be overcome.

The first thing is to see that the pupils are conscious of "perspective." There is no absolute need to use this word if it is considered too difficult, though it expresses what we want to teach better than any other. Do not waste time in trying to demonstrate the convergence of lines from small objects. The principle is far better learnt out of doors, and the children are doubtless already quite familiar with its existence. In towns the appearance of tramway lines, trolley wires, rows of street lamps, the kerb stones of the street, and many other things exhibit this convergence so markedly that it is forced upon the child's attention, and would be noticed, not only by the senior scholars that we are now dealing with, but by far younger pupils. Similarly in the country the hedgerows, the furrows in a ploughed field, the cart-tracks in the lanes, iron or wood fences, all illustrate the same principle. The school building, too, be it large or small, will generally provide a good illustration. It may therefore be taken for granted that the children are already aware of the existence of perspective: we have to teach them to apply this knowledge to their drawings. Make a sketch of a box or cube, such as Fig. 8, on the blackboard, and ask the class if it "looks right." The majority will answer unhesitatingly, No! Show them that it violates the rules of perspective, such as they observe in larger things outside—that C D really looks longer than A B, and that A B C D is nothing like a square. *Constant appeal must be made to the pupils' intelligence—to their sense of right or wrong in the look of objects, apart from all*

rules. They must be taught to criticise their own work after making an attempt to draw any object.

Some rules for guidance are necessary for most children, but they should be entirely subservient to the training of independent power of thought and judgment. Do not grasp the shadow and lose the substance. All rules and methods are good only in so far as they tend to develop this all-important faculty of observation.

Settle the question of "vanishing," as far as the principle is concerned, by outdoor observation, by sketches on the blackboard, by photographs, pictures, etc. It is a mistake to attempt to learn it solely from the small objects the scholars will be called upon to draw.

Appearance of Objects.

The next point is to make the pupils familiar with the great apparent change in the

form of objects, due to the position from which they are viewed. They have, of course, seen this in the case of circles, but the change is apparently yet greater in the case of rectilinear forms. Sketch on the board a few simple objects, such as shown in Figs. 9,

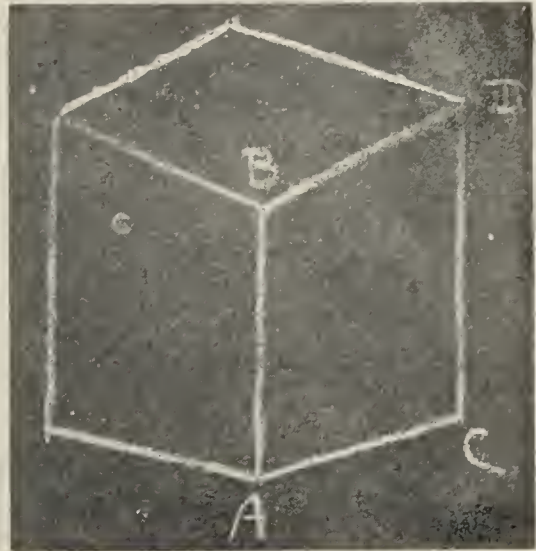


Fig. 8.—Wrong perspective.

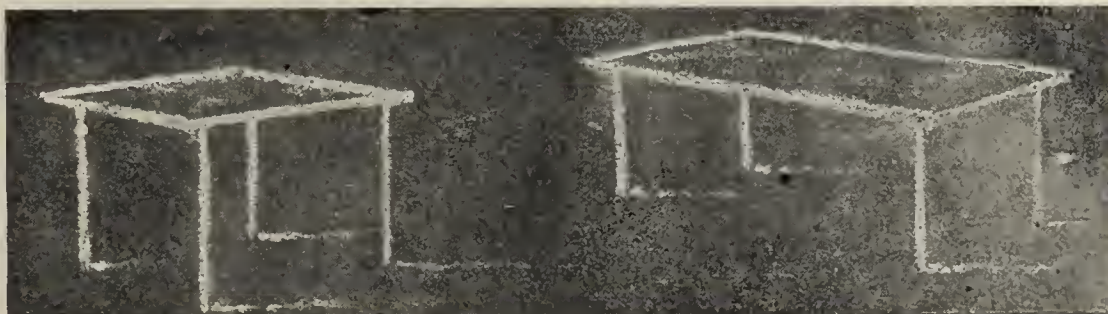


Fig. 9.

Fig. 10.

10, and 11, and ask the class what each one represents. I think they will answer readily enough a table, with a square top, an oblong top, and a circular top respectively. Yet though the form in each drawing is very far removed from the real shape, we still

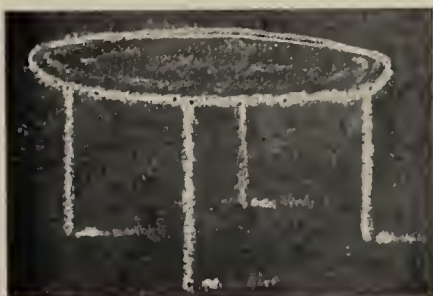


Fig. 11.

get the correct impression of the actual object. This is the sole aim of the work—to give by means of lines, on a flat surface, a correct impression of the real object. If the impression created in the mind

by looking at the drawing is different from that created by looking at the object, then the drawing is wrong some-



Fig. 12.—Correct perspective, wrong proportion.

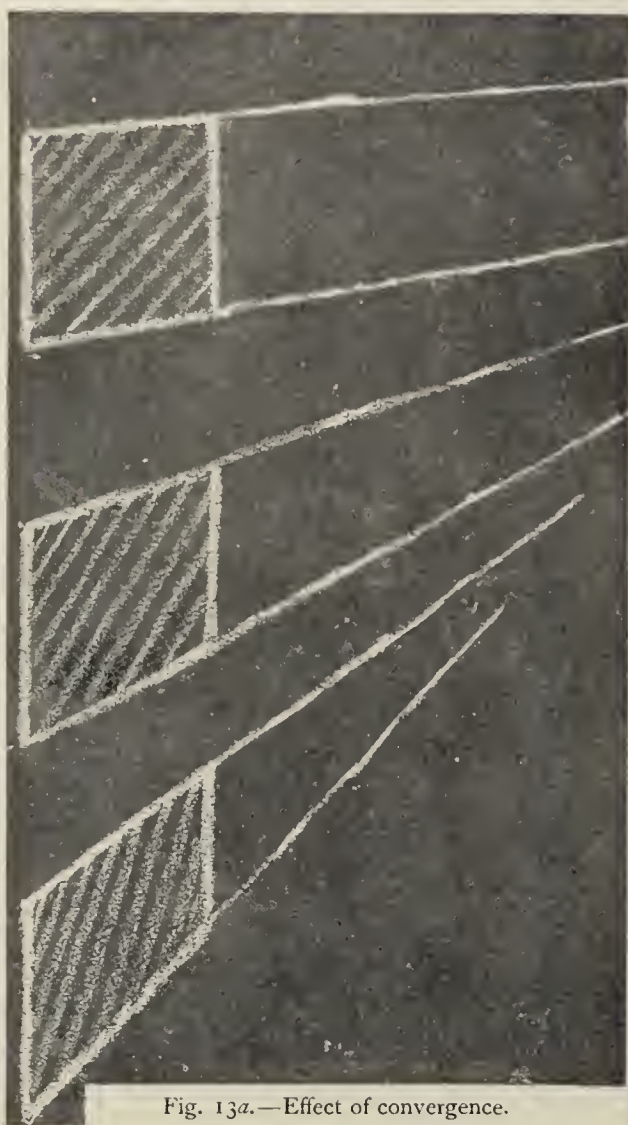


Fig. 13a.—Effect of convergence.

where. Therefore there must always be constant comparison between the drawing and the object, to see that the impression created in the mind is the same in each case. This is indeed the most difficult and important part of the work ; and yet in the anxiety to get proper “perspective,” it is often neglected altogether.

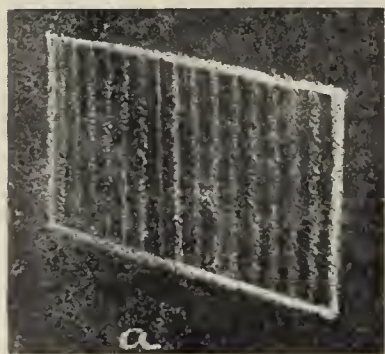


Fig. 14a.

For example, one often sees the sketch of a cube or square box drawn as in Fig. 12. Note that the perspective is perfectly correct, but only one face exhibits any resemblance to a square ; the others decidedly give us the impression of representing oblongs.

This power to judge whether a drawing faithfully represents any given object is most valuable, and can be cultivated to a great extent by rapid black-board exercises.

For instance, here is an example which I have tried many times in actual practice.

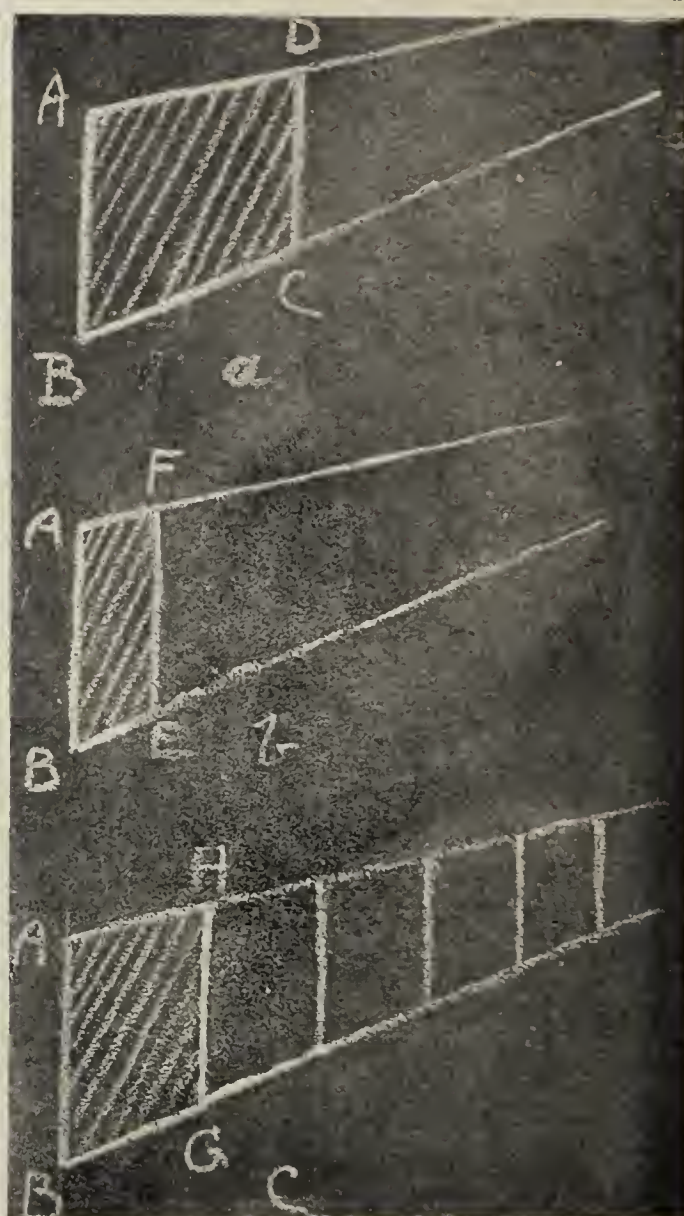


Fig. 13b.—Judging spaces.

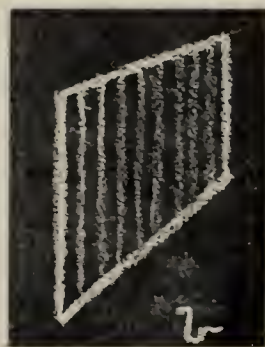


Fig. 14b.

Make a sketch on the blackboard like Fig. 13*b*. *A B* represents a post in the ground, and the vanishing lines are the top and bottom edges of a long fence. It is required to put in other posts, so that the spaces left between may be square. First measure *B C* equal to *A B*, and draw *C D*. The scholars will tell you at once that though *B C* is actually equal to *A B*, yet the space *appears* like an oblong—having the width greater than the height. Put in another line as at *E* in sketch *b*. The new space *A B E F* is still an oblong, but having the height greater than the width. The proper distance to represent a square must be somewhere between the two. Get one of the scholars to come and judge where the line should be, as at *G*, so that the space *A B G H* conveys to one's mind the impression of a square surface. [*In actual practice this work could all be done on one sketch.*] When the second post is in its correct position, let another scholar put

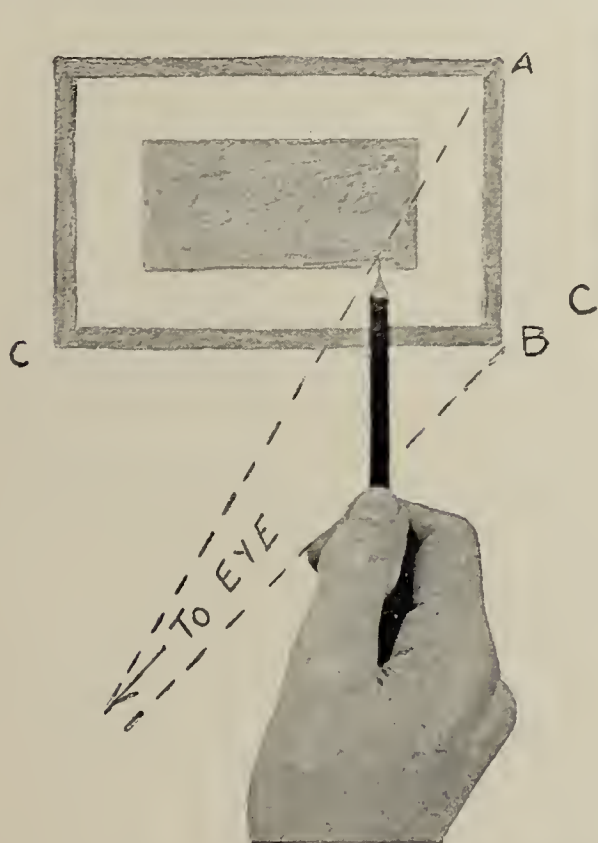


Fig. 15. Estimating comparative length of lines.

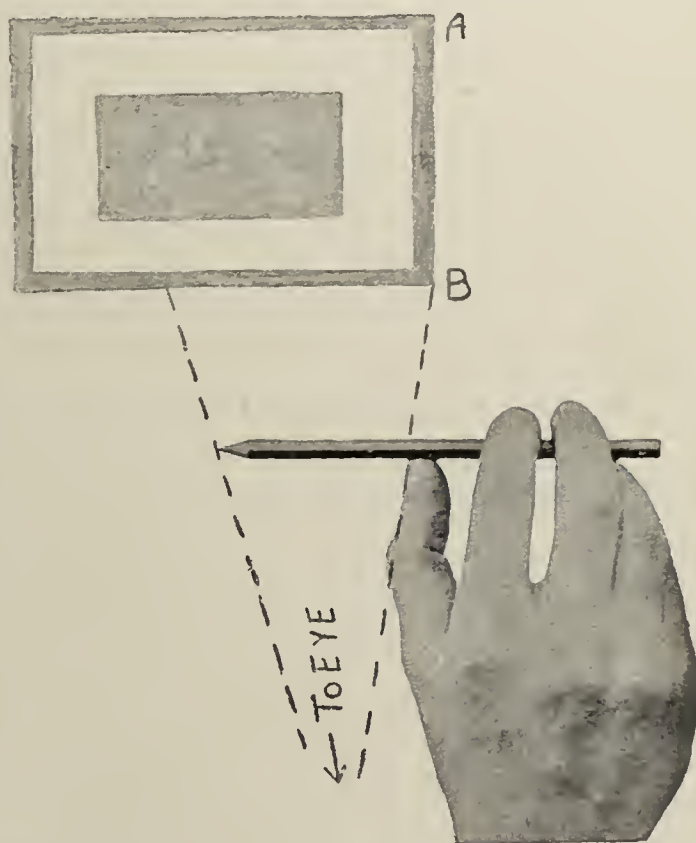


Fig. 16.

in the third, and the whole class judge of its correctness. So on with five or six others. I have never found any difficulty in getting this exercise done very accurately. Follow it up by representing rectangles of various proportions. The sole object of these exercises is to get the scholars to judge whether the conventional drawing really represents the actual object. The drawings may be widely different in themselves, and yet convey the same impression to the mind. For example, in Fig. 14 *a* and *b* represent the same oblong—that is, no matter whichever drawing we look at, we get the same concrete image on the mind—a rectangle about twice as long as it is high.

It is most important, too, to show the effect of “convergence.” In Fig. 13*a*, for example, the actual height of the nearest vertical line and the actual width between the perpendiculars is precisely the same in all three sketches. Yet the bottom figure

looks at least twice as wide as the top. The increase in the apparent width is due solely to the extra convergence of the top and bottom edges.

A few preliminary lessons like the foregoing will be necessary to show the children that, though it is most essential that the principles of perspective should be kept—drawings cannot appear right if we neglect them—it is also equally important to study the proportions of the object being drawn, and to see that the drawing is a faithful representation of it, and conveys the same impression to the mind as when we look at the actual object.

The next step is to put the principles into practice. We cannot, however, straightway confront them with an object to draw, particularly the large classes found in our ordinary schools—unless, indeed, we wish to find out how badly they will do it. A little more preparatory work must be gone through in order that reasonable success may be attained at the outset.

Measurements of Length.

It was pointed out in Stage IV. that two kinds of measurements were necessary—namely, *measurements of length* (or rather comparative lengths), and *measurements of direction*. For the former the pencil is held as shown in Fig. 15. The point of the pencil is brought exactly opposite one extremity of the line to be measured, and the thumb, which acts as an indicator, is then moved up or down until it coincides with the other extremity. Theoretically a ray of light passes from the eye over the top of the pencil to A, and over the thumb to B. This measurement may now be compared with the bottom of the frame B C as at Fig. 16. It will be seen that B C is about half as long again as A B. Only one eye must be used in making these measurements; the other must be closed. Two or three important points must be carefully noted.

1. Such measurements should only be used to test the main proportions; they are unnecessary for anything else. For example, it is useless to attempt to measure the width of the frame in Fig. 15, or even the mount. The method is altogether too clumsy, and the eye should be the sole judge of all such details.

2. In making a comparison between two spaces, the pencil must be held the same distance from the eye in each case, otherwise the estimate is fallacious. The best way to secure this is to hold the pencil always at full arm's length.

3. These measurements are comparative only. They should never be actually transferred to the drawing.

It should be clearly understood that these measurements ought to be servants, not masters. They are undoubtedly a great aid in the earlier stages of the work, when the eye is insufficiently trained to trust in its own judgment, or when errors occur through absolute inability to "see" the form or proportion. The trained eye sees clearly enough, but the untrained eye fails altogether. It is well-nigh useless to tell a pupil to alter his drawing—to make it wider or narrower, to make lines converge more or less. He will do it, of course, but will remain just as much in the dark, and be just as likely to repeat the same error. No, he must first be convinced that he is wrong—that his judgment is at fault; and practically the only way to do this is to measure with the aid of the pencil.

In time, as the eye becomes accustomed to judge space and direction, the pencil measurement can be done away with altogether.

Again, it is well to use these measurements as checks rather than as crutches. Let the eye judge first by close observation, and then use the pencil to confirm the judgment or otherwise. I cannot put this phase of the work too strongly. Rules and regulations and measurements have been so rampant in all object drawing, that the training in real observation has been practically nil. Whether they are useful—or worse than useless—depends entirely upon the way we employ them. Used in moderation and *with intelligence*, they are a great help; used slavishly and *unintelligently*, they are a hindrance to real training.

Measurements of Direction.

The simple principle of this was dealt with in Stage IV., but it plays a much more important part here, and is really the main thing to be studied in this stage. The apparent direction of lines is so different from their real direction as to be most puzzling. For example, a perfectly horizontal line may be truthfully represented by a perfectly vertical one, or indeed by a line sloping at any angle. It depends solely upon the relative position of the spectator and the line. Some instruction as to the method of judging the apparent direction of lines must be given.

Since direction only is required, and not definite length, the pencil is now best poised in the fingers, as in Fig. 17, leaving the upper edge perfectly clear. Suppose A B to be a horizontal line, and *parallel to the spectator*. Hold the pencil at arm's length and *exactly at right angles to the line of sight*. Raise it until it hides the line A B, or a portion of it, from the spectator's view. The pencil still remains quite horizontal, and A B would be actually represented on paper by a horizontal line. Five or six chalk lines drawn on the wall of the classroom at equal intervals serve very well for this experiment. Practically these would be parallel to every child

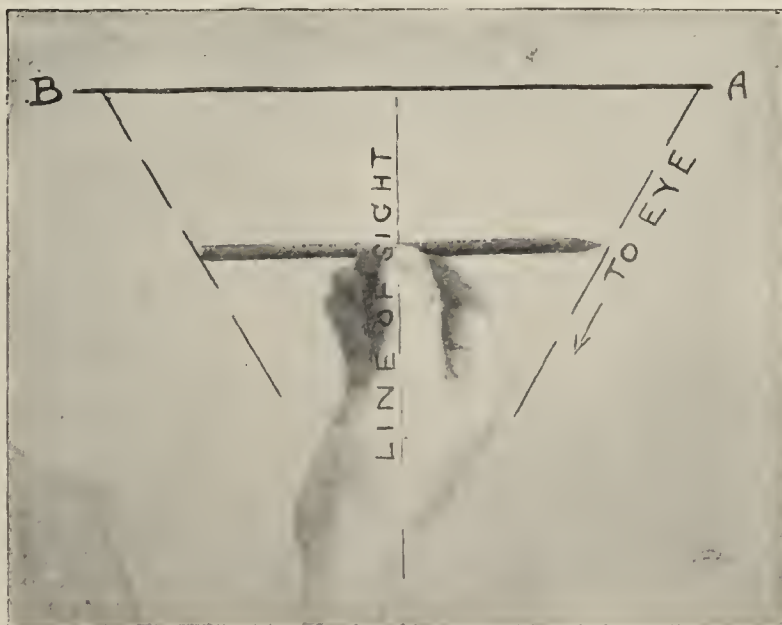


Fig. 17.

in the class, and the instruction could be simultaneous. Proceed from this to estimate the apparent direction of (a) horizontal lines which are not parallel to the spectator, (b) lines which are themselves inclined. Except for those lines in Section (a) which are on the eye-level, the horizontal pencil will not now cover any of these lines. For example, if the scholars are now asked to test any of the chalk lines suggested above, which are to the left or right of them instead of in front, they will find that if they keep the pencil horizontal the line will not now be covered; it will apparently make an angle with the pencil. The judgment of this apparent

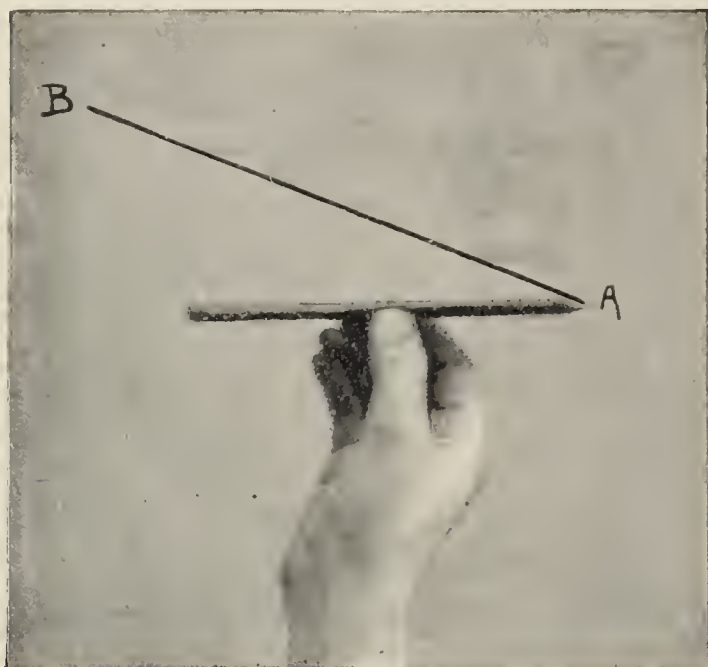


Fig. 18.—Estimating inclination of line.

position gives the actual slope required to correctly represent the line. Compare it with A B in Fig. 19. If pupils can be trained to do this well, there is but little else they need in the way of mechanical help. Lines in all directions and in varying positions should be judged. The simple rule is, Make the pencil cover the line you wish to represent; this will give its apparent direction. As a rule, one or two lines at most, in any drawing, are all that need be done in this way; the eye does the rest. (*N.B.*—Figs. 17, 18, and 18a are, of course, diagrammatic. In actual practice the real line A B would be a long distance in front of the pencil. The latter merely comes in a direct line between the eye and A B.)

Two things are most essential, whether measurements of length or of direction are being made:—1. The pupil, whatever be the position of his seat, must face the object squarely, and must turn his body if necessary. 2. The two ends of the pencil must be kept at the same distance from him, or, in other words, the pencil must be at right angles to the line of sight. Over and over again one has to correct errors in this matter. The line being measured seems to act as a magnet, and draws the pencil towards it until both are parallel. Of course no measure-

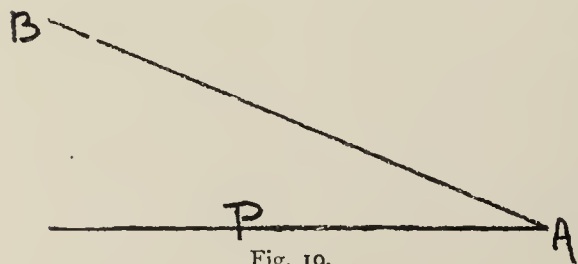


Fig. 19.

angle really forms the most difficult part of model drawing. Though the line itself is perfectly horizontal, yet to the spectator it will appear to slant upwards, as in Fig. 18 (the line is assumed to be below the eye-level), and would be represented in a drawing as shown in Fig. 19, where P represents the horizontal pencil, and A B the line. Note that the angle at A is the same in each case.

The principle may, however, be carried a step further, and render yet greater help. Raise the left-hand end of the pencil until it will cover the line A B (Fig. 18a). The pencil in this

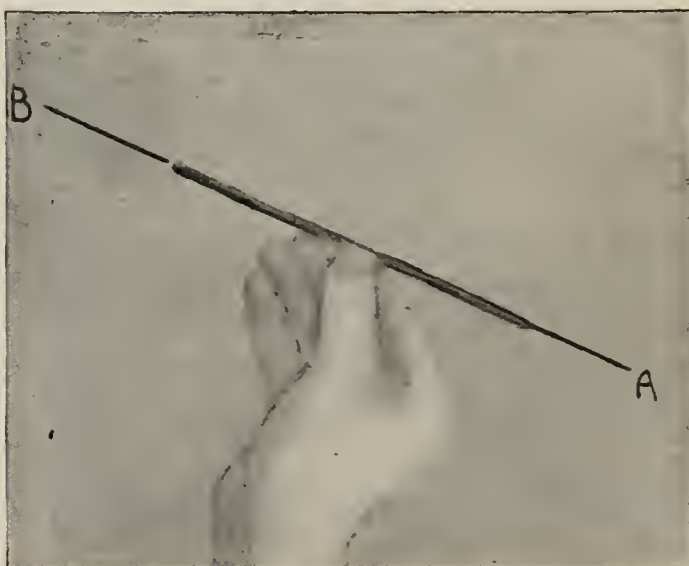


Fig. 18a.—Estimating inclination of line.

ment can be obtained in this way; it only misleads. See, therefore, to the correct position of the body, and especially to the correct position of the pencil. It may be moved throughout an entire circle in a vertical plane, like the hands of a clock, but must never be moved in a horizontal plane, like the needle of a mariner's compass. The lines in any classroom—edges of doors, windows, tie rods, picture frames, mouldings, etc.—will furnish as many examples for practice, both above and below the eye-level, as the scholars are likely to need. A pointer held in the hand and moved about is also a good test. The teacher can readily tell if the pencils are being inclined in the right direction.

After these preliminary exercises, the scholars may be set to **Object Drawing.** draw a simple object which will involve the principles that have been explained. There is nothing better than the cube as a first exercise. In some quarters there is a tendency to despise these regular geometrical solids, and teachers have been advised to burn them. It would be a profoundly foolish thing to do, for they serve a good purpose. Their very regularity is most useful when principles have to be demonstrated. They are to object drawing almost what formulæ are to mathematics—they give us the key to so many solutions. Thus, however complicated they may be, circular objects have no terrors to any one who thoroughly understands the principle of drawing the cone and cylinder. Similarly, all the familiar objects shown in Plates V., VI., VII., and VIII. may be related back to the cube, square prism, triangular prism, or square pyramid. Once the fundamental principles which must be observed in drawing each of these type forms are known and appreciated, we can attempt any object of similar shape, although it may be irregular.

In order that all the pupils may have a reasonable view of the **The Cube.** object, it is far better in these earlier exercises to use two or even three models to draw from. If these are placed at equal distances in front of the class, the views of the different pupils only vary slightly, and the teacher is enabled to give one explanation suitable for all. Place the models below the eye-level at first. Let the scholars poise their pencils on the fingers just as in Fig. 17, and raise the pencil until it just touches the lowest nearest corner of the cube, as in Fig. 20. Ask them to note most carefully the two bottom edges of the cube as they recede. Which edge appears to have the greater inclination to the pencil, or are they both alike? What is the apparent size of these angles? Draw one or two slanting lines on the board, and ask if the edges of the cube *appear* to slant so much. *In making these observations, be quite sure the pencil is held at right angles to the line of sight.* Beginners invariably make these two lines to slant far too much. They really imitate the angles at which the lines are receding from them, rather than estimate the apparent slope due to the relative position of themselves and the line. Now let each pupil try to put

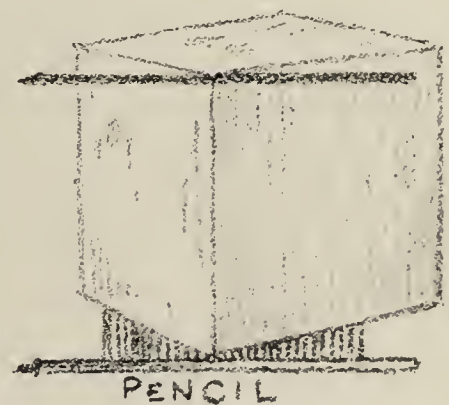


Fig. 20.—Estimating angles.

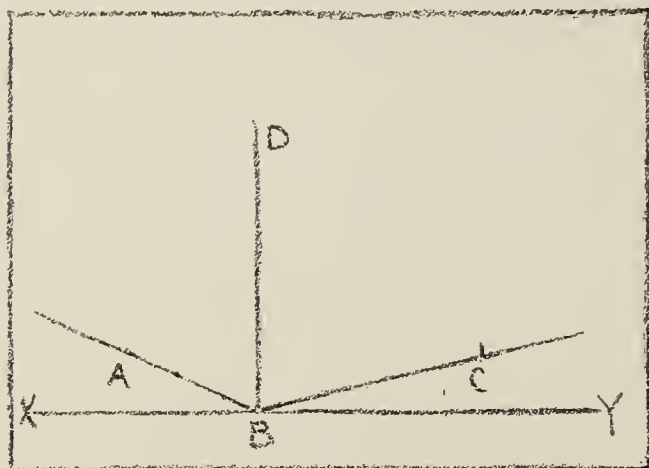


Fig. 21.

appear equal, the point then being fixed in the centre. Draw the lines AB and BC, after estimating their apparent direction most carefully, by holding the pencil horizontally as in Fig. 17. Test the inclination by tilting the pencil to cover the edges as in Fig. 18a, and compare the slant of the pencil with the slant of the lines. *These are the two most important lines in the drawing.* Having drawn them as correctly as possible, draw the nearest vertical edge, BD, fixing the height as great as the paper will allow. If these three lines are put in correctly, the particular model can then be completed entirely by rule. Draw DE and DF, Fig. 22, to meet BA and BC respectively, remembering that the greater the inclination, the more rapid will be the convergence. This is shown in the sketches; but it requires some practice to estimate

down so much on paper as follows:—Draw a horizontal line, XY, Fig. 21, nearly at the bottom of the paper, to represent the pencil. Fix the point B towards the left, or the right, or in the centre, just according to the amount of space which the apparent shape of the drawing demands. Two sketches are shown here—Fig. 21, where the left-hand space appears smaller than the right, and the point is therefore fixed on the left of the paper accordingly; and Fig. 21a, where the two faces

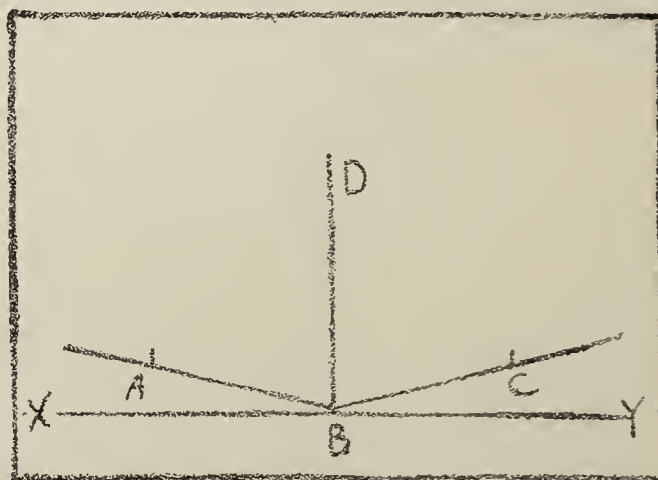


Fig. 21a.

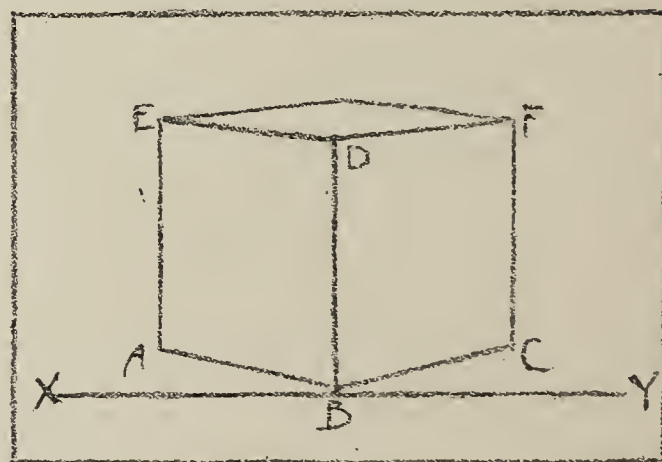
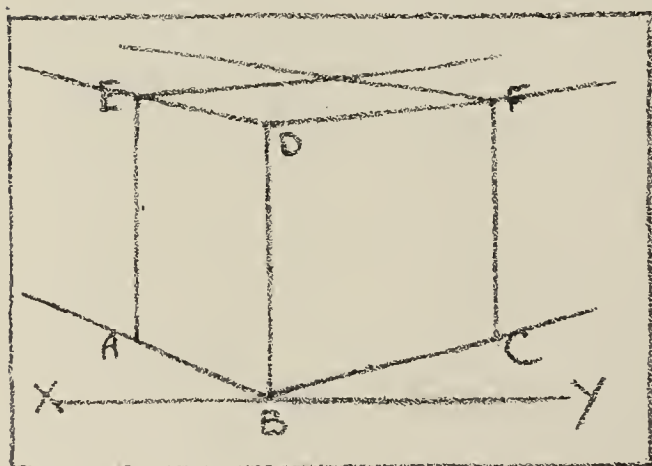


Fig. 22.

exactly how much it should be. Some idea may be gained by holding the pencil to the upper corner (see Fig. 20), and noting how much smaller the angles are than at the

bottom. Now put in C F and A E, so that the two surfaces represent squares—just as in the exercise given in Fig. 13*b*. The width of the two faces need not be measured with the pencil: the eye will judge correctly enough when the spaces look square; and they must appear square, or the drawing is wrong. Lines from F and E complete the sketch, and show the top a square too, like Fig. 9; be careful it does not suggest a rectangle like Fig. 10. The outer rectangle in Figs. 21 and 22 represents a sheet of paper or page of the drawing book.

There are, of course, other methods of procedure. Some teachers prefer to draw the first three lines as above, and then, after very careful judgment, put in the other vertical lines A E and C F, completing the top as before. Others fix accurately the position of the three vertical lines first, and then put in the receding edges. It will probably be best to combine all these methods, for if the first be adopted, care must be taken to see that the apparent relative widths of the two sides are correct; if the other methods, equal care must be taken to see that the sides appear to be square. In fact, one acts as a most useful check upon the other, and the final result should be the same in either case.

After all, every method is but a means to an end, and should be entirely subordinated to the end. We show our pupils these various methods of setting about the work at first, just to help them on the way, as it were. Our real aim is to teach them to see—to judge accurately the apparent direction and lengths of lines. As a rule, this power is best secured by doing the work systematically; but if any pupil develops an independent power of accurate judgment and observation, let him go his own way by all means.

Again, some teachers prefer to draw the top face first and work downwards. There is nothing against this; it is immaterial so long as the eye is being trained to look *intelligently* at the object, to estimate accurately the direction of the edges, to compare most carefully the various parts, and to see that the drawing made is really a faithful representation of the object.

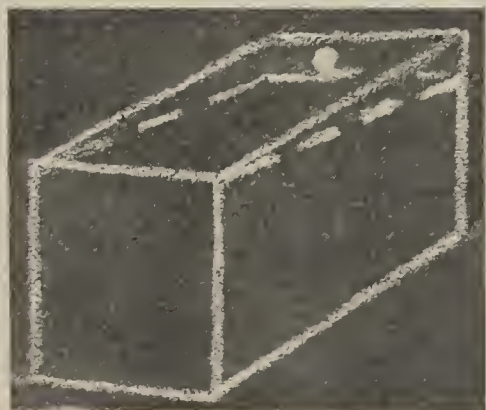


Fig. 23.

Some Common Errors.

In addition to such errors as inaccurate perspective and wrong proportion, such as shown in Figs. 8 and 12, there are others which are not quite so obvious. For instance, one frequently sees the horizontal top of rectilinear models drawn like Fig. 23. The pupil can probably see nothing wrong—both perspective and proportion seem correct. But a closer look

at the upper surface will show that it does not appear horizontal. Place a marble on the top of the prism, or box, or whatever is being drawn. As the surface is horizontal, the marble will stand still. Indicate the marble on the drawing by a dot, Fig. 23. Now ask if it looks as though it would stand still, or would it roll? There is never any difficulty in getting the answer. It will roll down. Show that it is caused by having

one pair of lines at too great an angle for the other two. They will not meet on the same horizontal line. A small sketch like Fig. 24 will illustrate this, and show also the inclination the lines should have taken. Fig. 25 is an enlarged drawing of the same thing. Note the unstable look of



Fig. 24.—Diagram to show correct and incorrect position of vanishing points for horizontal surfaces.

a marble on this surface. This point needs constant attention. The dotted lines show the proper position in each case, and serve to emphasize the slope of the original surface.

Another fruitful source is that the receding lines will not all meet at the same point. They are all converging, but not in such a way as to make them all meet at *one* point (see Fig. 26). This is an error not very easy to detect. The drawing is large, and the actual point of convergence often falls far beyond the confines of the paper. The inclination of the lines at the base of these rectilinear figures are at first invariably drawn too large. The pupil is apt to let the actual angle at which



Fig. 25.

the lines are receding outweigh his judgment of the apparent inclination due to the relative position of himself and the object. He must be shown that the inclination depends to a great extent upon the distance the line is above or below the eye-level. The angle at which the line actually recedes from the spectator may be very great, but if it is nearly

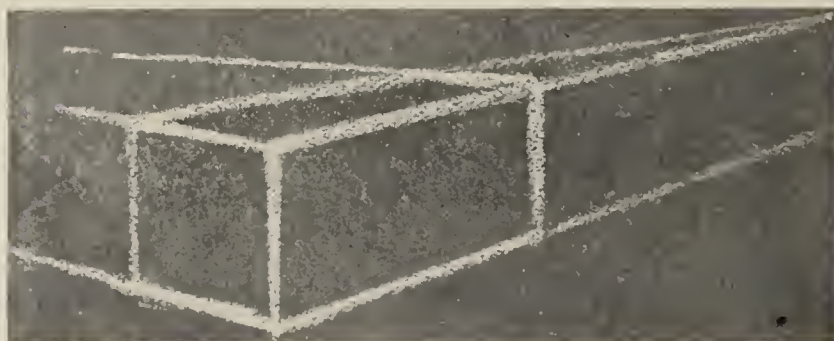
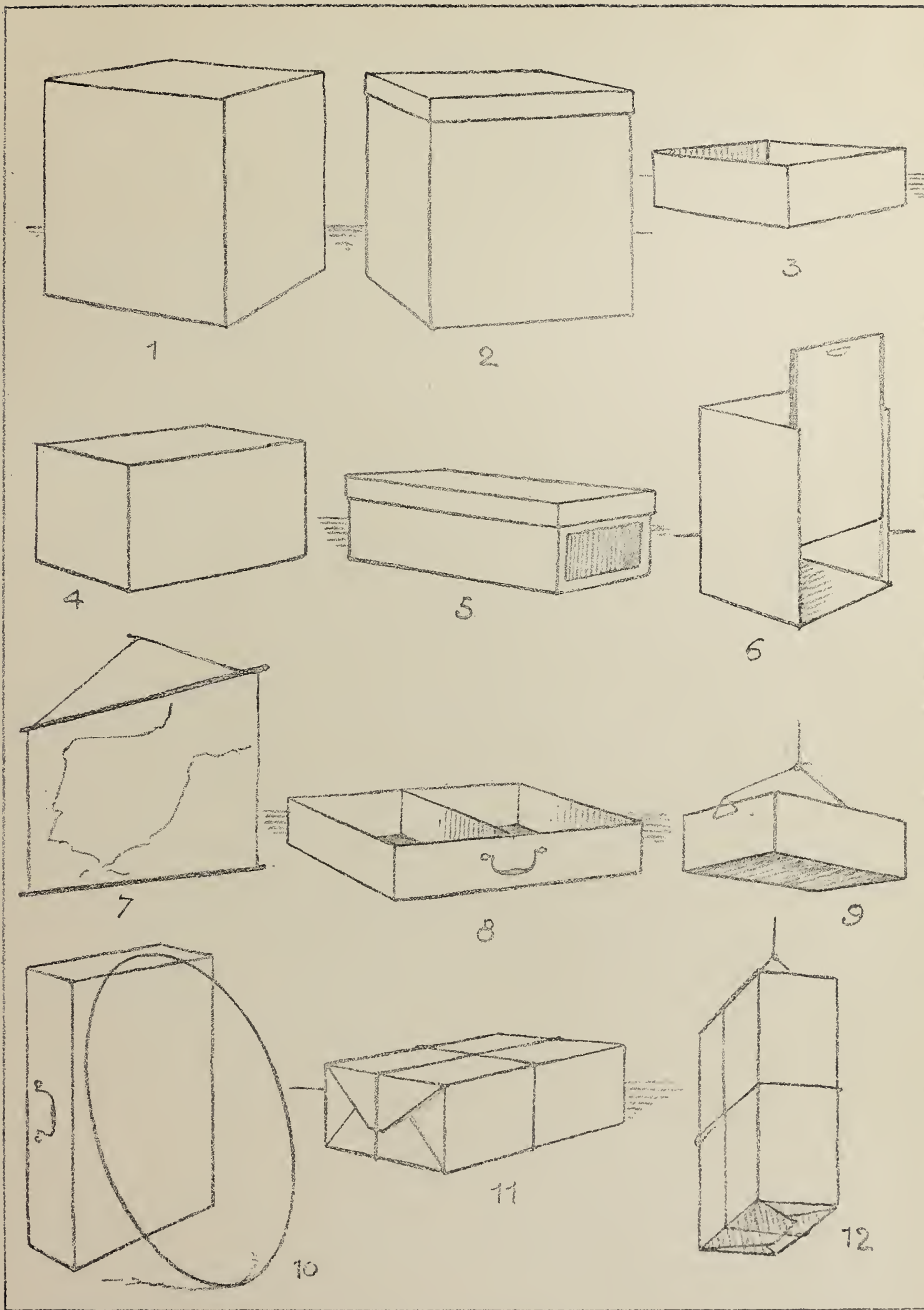


Fig. 26.—Lines not vanishing to the *same* point.

on the eye-level, the apparent inclination will be small; but as the line goes farther from the eye-level above or below, the inclination becomes apparently greater. It is of great assistance in the earlier exercises to hold the pencil as in Fig. 27, and estimate how far

PLATE V.



Stage V.]

OBJECT DRAWING.

[First Period.

THE CUBE AND SIMPLE OBJECTS ALLIED TO IT.

the two extreme corners seem to come up the nearest vertical edge. This is another aid to enable the pupil to test the accuracy or otherwise of his eye-judgment. With a normal view of the cube, these points only come a comparatively short distance up the edge as shown.

The top of the cube and similar models is often drawn too wide. How narrow the vertical space is can be readily shown in a similar way to Figs. 4 and 5, page 42 in the Handbook to Stage IV.

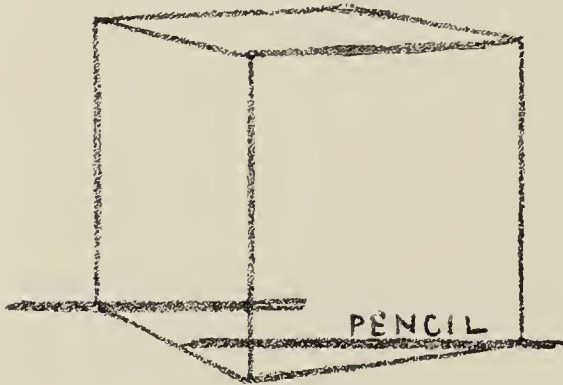


Fig. 27.

**Objects based on
the Cube, etc.,
Plate V.**

The simple principles enumerated thus far underlie the drawing of all rectilinear forms. Once get the scholars to intelligently interpret the cube and square prism, and drawings such as shown on Plate V. will be easy. Whatever detail the object pos-

sesses, the basic shape—giving the main proportions—should be drawn first. Light suggestive lines, drawn with the pencil held as shown in Fig. 2, are all that is necessary, but they need to be most accurately placed and spaced. This stage *must* be put right before proceeding to break up the surface into divisions as in Figs. 8, 11, and 12, or Plate V.

The objects delineated in Plate V. are very commonplace, and could certainly be found in any classroom. Figs. 11 and 12 are simply boxes or pieces of wood packed up into parcels and tied with string.

**The Triangular
Prism,
Plate VI.**

There is practically no new principle involved in drawing objects such as those shown in Plate VI., and yet students, young or old, find difficulties when they are confronted with such things for the first time. The main difficulty lies in the fact that the surfaces are inclined to the ground plane, and that they do not make right angles with each other. Take the triangular prism, or, if this is not available, bend a piece of cardboard as in Fig. 2, Plate VI., or use the portfolio in which the large sheets of this series are packed—Fig. 3. The two base lines will be drawn just as in Fig. 21, and should give no trouble. Two or three suggestions may

be made for obtaining and testing the triangular face. Hold the pencil perfectly vertical and opposite point A on the model (Fig. 28). Note carefully the angle which the slanting line makes with the pencil, and draw A and B as in Fig. 29. Study the proportion of the triangular end, and draw B C, Fig. 30. This makes the drawing of the end entirely dependent upon observation; no measurement or mechanical calculation has

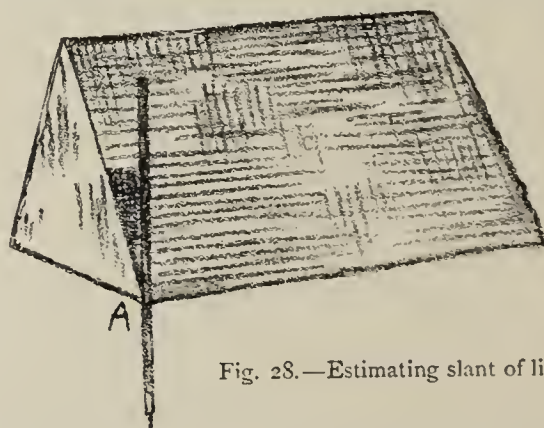
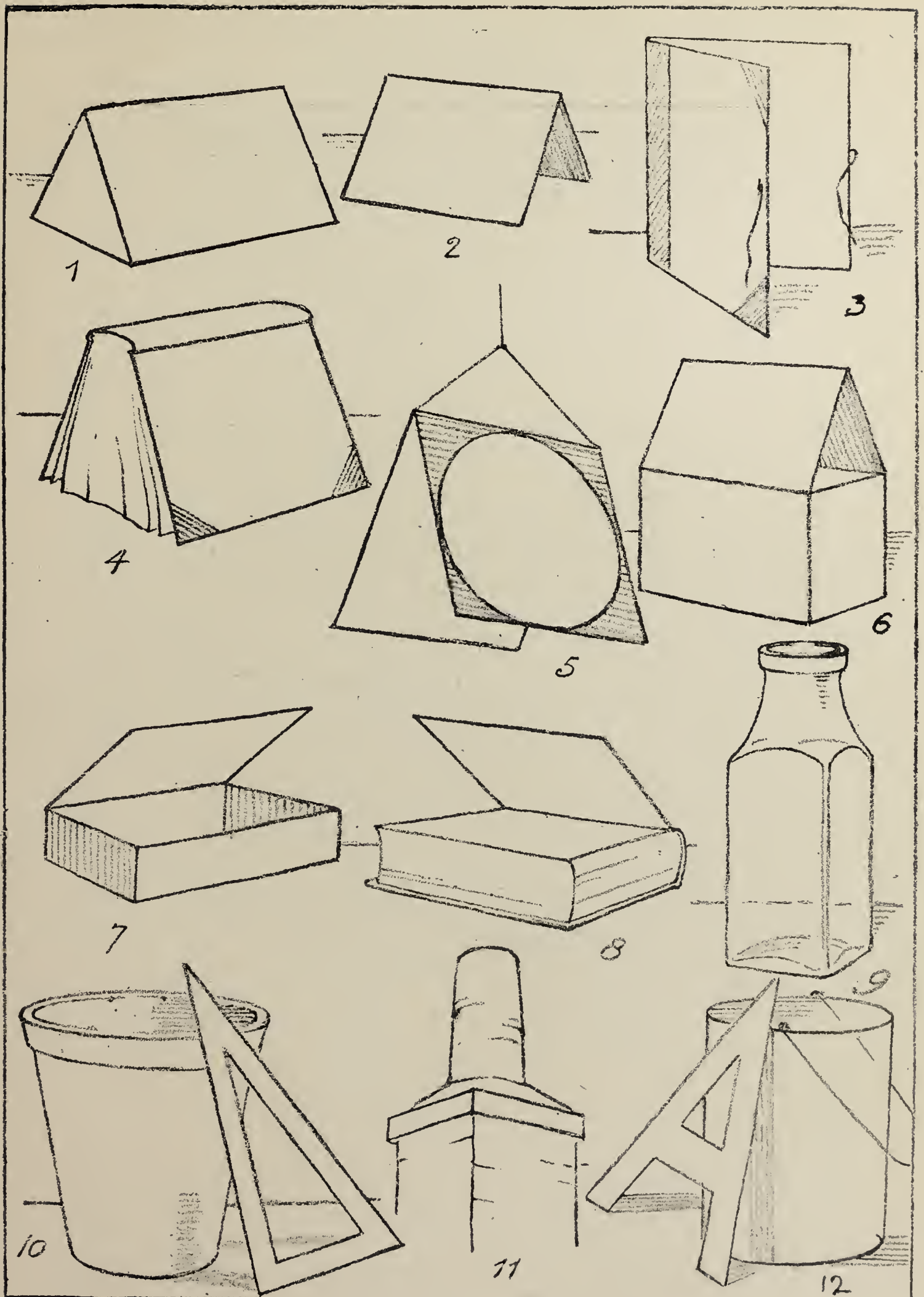


Fig. 28.—Estimating slant of line.



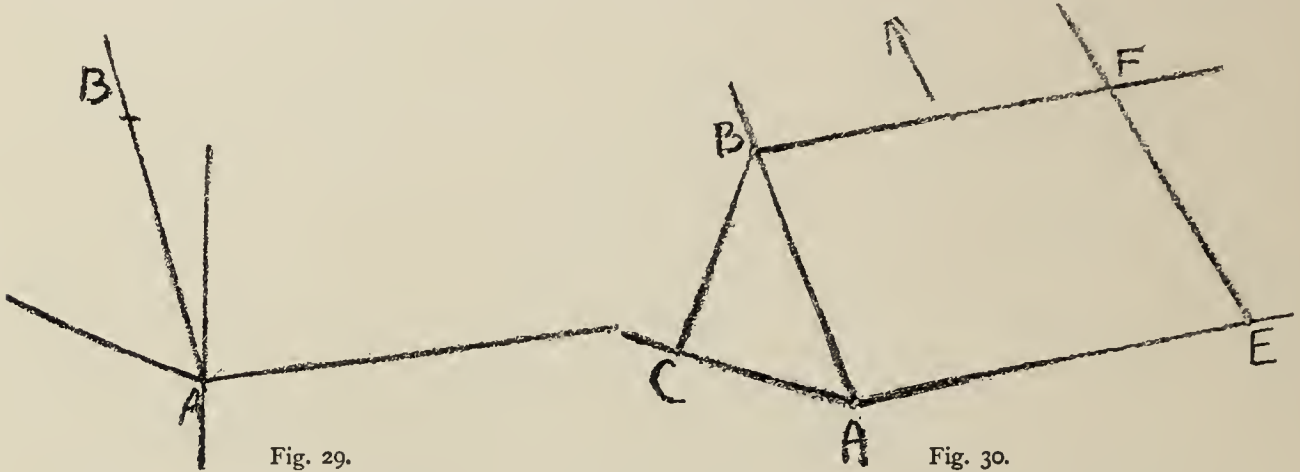
Stage V.]

OBJECT DRAWING.

[Second Period.

THE TRIANGULAR PRISM AND SIMPLE OBJECTS ALLIED TO IT.

been made. If the first attempt should be as at Fig. 31, then obviously this triangle could not possibly represent the solid sketched in Fig. 28—the face is much too tall. Similarly in Fig. 32, the apex of the triangle is not over the centre of the base, and



must be corrected. In Fig. 33 the triangular face is not vertical. All these errors are certain to occur ; but both the detection of them and the correction are not such a difficult matter, if only *there is a constant comparison made between the drawing and the*

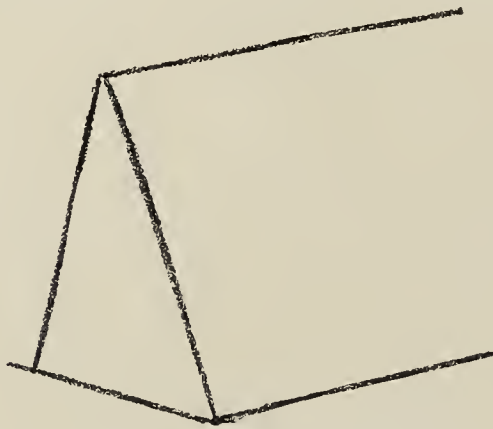


Fig. 31.—Triangular face too high.



Fig. 32.—Apex not over centre of base.

model, to see that both things convey the same impression to the mind. Many errors creep in because the pupil works by rule, and thus thinks he is bound to be correct, whereas in truth an ounce of accurate and intelligent observation is worth a pound of rules.



Fig. 33.—Triangular face not vertical.



Fig. 34.—Another method of obtaining the apex.

Another method is to draw the base as before, and fix the length of A C, Fig. 34. Take a point D a little beyond the centre of A C, and draw the vertical line D B. Actually $AD = DC$; but as the portion A D is nearer the spectator, it appears a little

greater. Fix the height of D B, and draw the slanting sides. This method is more mechanical than the previous one. When one triangular end is correct, the other follows easily enough. Note, however, that A B and E F, Fig. 30, vanish upwards, but that the lines of the farther slanting face would vanish downwards. It is always well to think out these points before beginning the actual drawing.

Objects above and below the eye-level should be drawn. Fig. 5, Plate VI., is simply a piece of stout cardboard bent in the centre, and having a circle drawn on the outside. This circle provides a little extra work for the best pupils. It in no way interferes with the rest of the sketch, and could be added after the remainder of the drawing was completed. Figs. 9, 10, 11, and 12 give exercises in drawing circular as well as right-lined forms. By cutting good-sized letters out of stout cardboard, many similar exercises to Fig. 12 may be made. They are most suitable too, for there is absolutely no detail, and the thickness is scarcely appreciable. Fig. 11 would naturally be an outdoor sketch, unless by chance such an object were clearly visible through the school windows. Wherever possible, go outside the school walls for examples to draw. If a simple dog kennel or a Noah's ark could follow the drawing of Fig. 6, how interesting the exercise would be.

The Square Pyramid.

It must not be thought that because these type models are dealt with separately, there is any real difference in the principles involved in drawing them. The aim of all drawing is to cultivate accurate eye judgment, and the fewer rules we have the better. These models, however, possess certain properties peculiar to themselves, and the drawing of them furnishes some

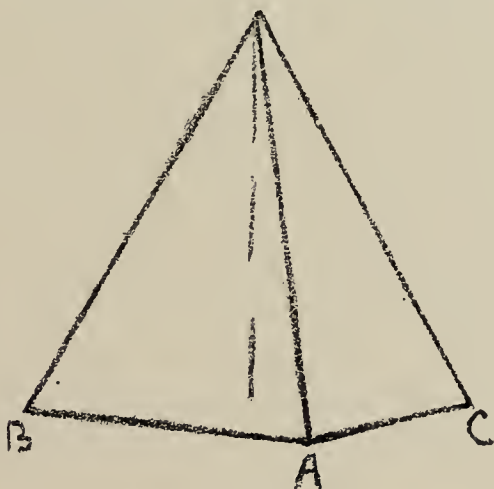


Fig. 35.

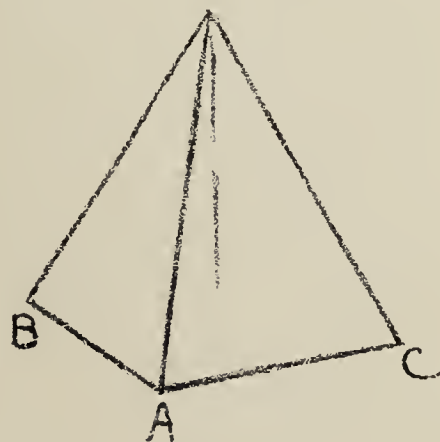


Fig. 35a.—Determining position of apex.

inevitable pitfalls, which can be avoided by a little forethought and explanation. It is simply these common errors that we are trying to combat: to give the pupils some stand-by to save them going hopelessly astray; to let them understand the fundamental principles which must be adhered to in all circumstances. Such knowledge is of great assistance to the eye during the early stages of the work.

The base of the pyramid, or the two nearer edges, will be ascertained in exactly the same way as the base of the cube or other similar surface. The sole difficulty lies with the apex. This may be explained in a word. It is exactly over the centre of

the base, and must always appear so in the drawing. To get this accurately, some complete the base and draw the diagonals as in Fig. 36. This, however, does not always give an accurate result. It necessitates most careful work throughout. As a rule, it is better training for the eye to judge the position of the apex after drawing the two nearer edges of the base, as in Figs. 35 and 35*a*. In normal views such as these the apex is for all practical purposes vertically above a point midway between B and C. If the two sides are exactly equal, then the nearest sloping edge is also a vertical line. This method of working usually gives a more correct result than the "perspective" method of Fig. 36. For one thing, the pupil depends more upon eye judgment than upon rules, and this in itself is good. He is compelled to look at the model carefully and to compare his drawing with it. Further, the eye very readily tells whether the apex is really over the centre of the base. The error in Fig. 37, for example, is easily detected. The danger of trusting to the diagonals is that the pupil is apt to think his work must be correct if he follows this mathematical rule, and he generally accepts the

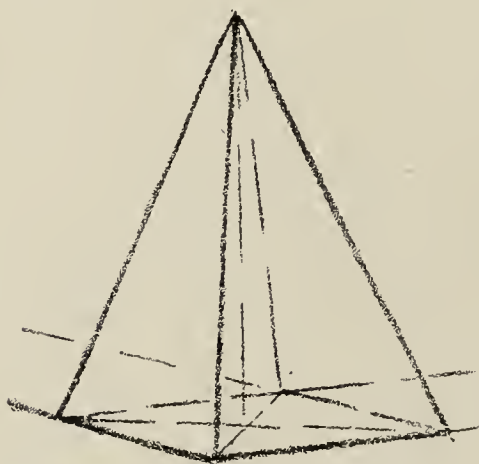


Fig. 36.—Determining position of apex.

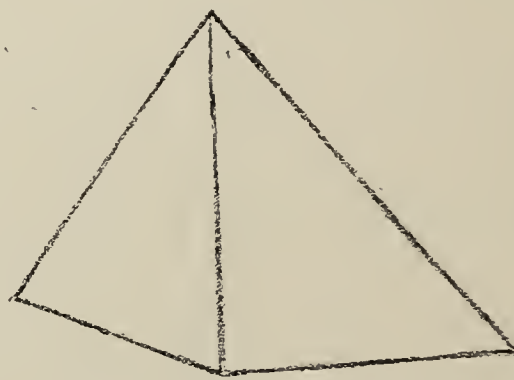


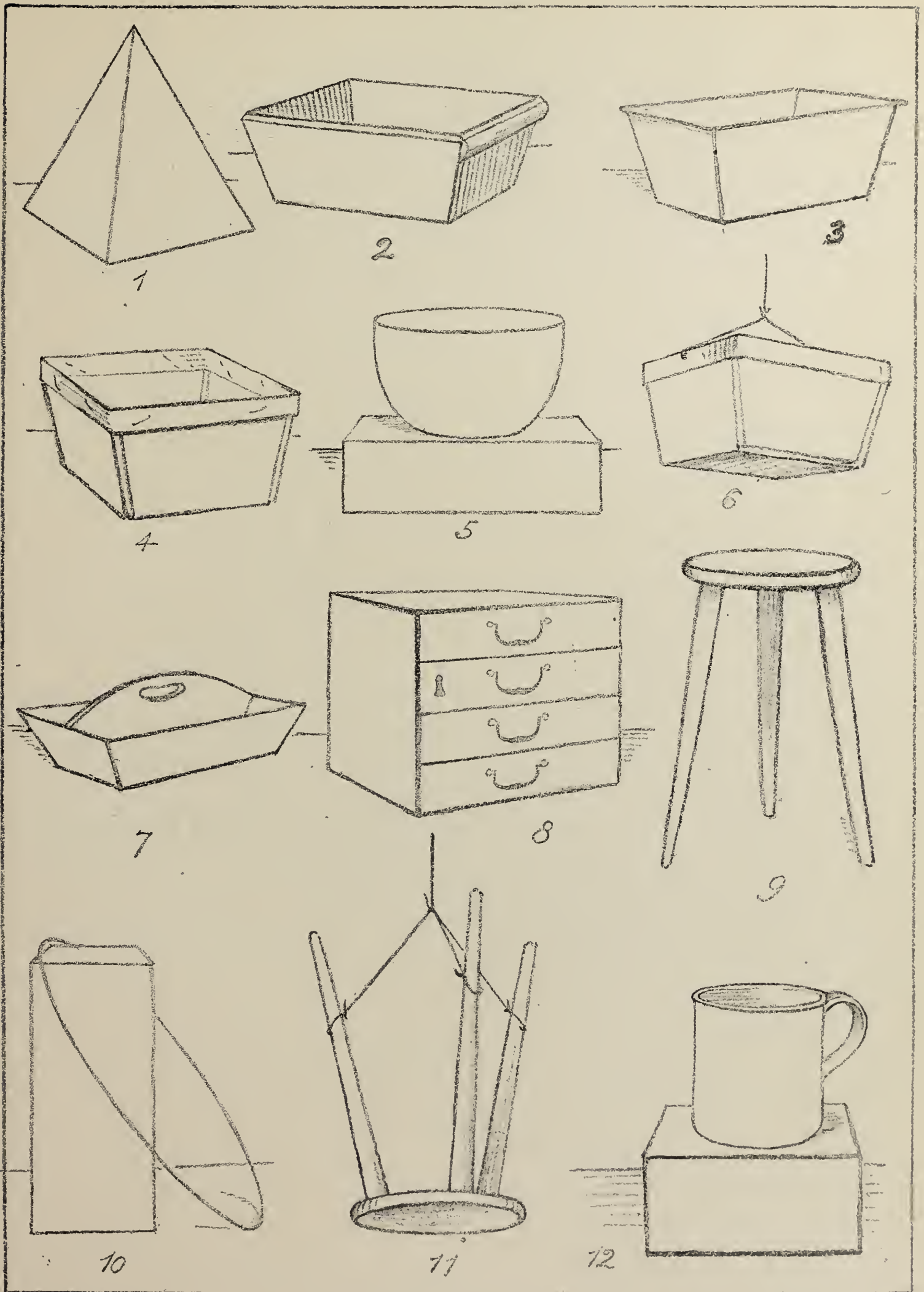
Fig. 37.—Apex not over centre of base.

drawing that results from it, without first carefully comparing it with the model to see that it is really correct.

It is not so much for drawing the pyramid itself, however, that these things have been pointed out, but rather for the effect it has upon drawing objects based upon this model—usually "truncated" pyramids, such as Figs. 2, 3, 4, and 7, Plate VII. Though the slanting edges of these do not actually meet at a point, yet it must be borne in mind that they would do so if produced. If the lines are put in as at Fig. 38, the eye immediately tells one something is wrong (without producing the lines as in the sketch), and a knowledge of the fundamental principle which must be observed soon enables the error to be corrected. Compare Fig. 38 with Fig. 38*a*, which is a tracing from Fig. 3, Plate VII.

The objects on Plate VIII. involve no new principle. They are small groups of familiar objects which may be readily obtained. Figs. 6 and 12 are above the eye-level; Fig. 9 both above and below.

If these or similar groups, or even single objects, can be accurately drawn at this stage, the pupil's progress is assured.



Stage V.]

OBJECT DRAWING.

[Third Period.

THE SQUARE PYRAMID AND OBJECTS ALLIED TO IT.

Remember that "object drawing" is of vital importance—it is a greater test of accurate observation than drawing from Nature, for it admits of no give and take. It will be successful only if care is taken at every step to cultivate accurate judgment of direction and proportion; to see that the drawing made faithfully represents the object. Do not let the pupils get lost in a maze of rules and regulations, but train the eye to see form, to institute a constant and careful comparison between their sketches and the

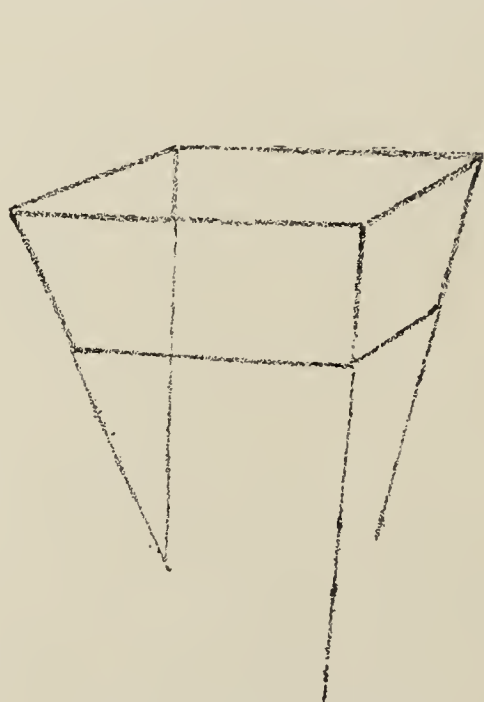


Fig. 38.—Incorrect slant of edges.

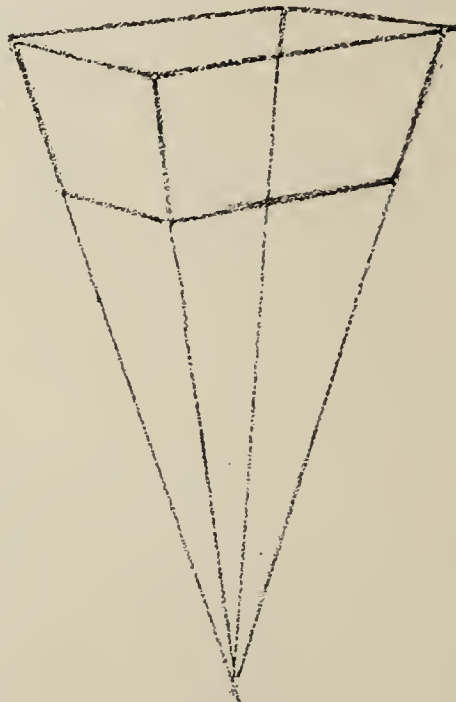
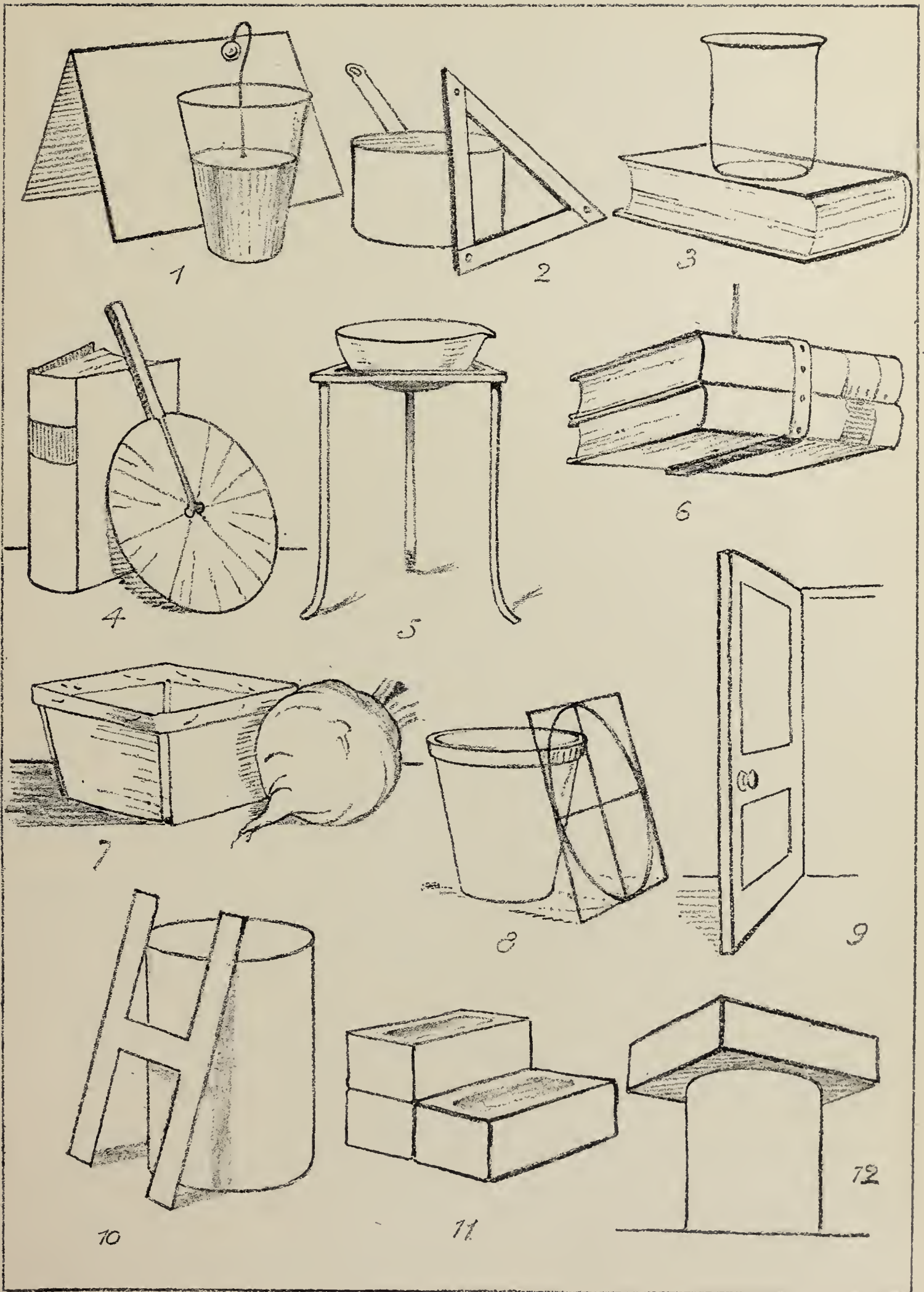


Fig. 38a.

object. Some aids will be necessary, for a time at least; but nothing, after all, is so reliable as a trained eye.

The sketches should be executed to a large scale in a free style something like the illustrations in the plates. Broad, open gray lines are far better than hard, wiry ones, especially when they are vigorously put in. Light shading with the pencil adds considerably to the effect; indeed, the drawings may often with advantage be carried much further in this respect.

PLATE VIII.



Stage V.]

OBJECT DRAWING.
SIMPLE GROUPS OF OBJECTS.

[Fourth Period.

BRUSH DRAWING

UNLIKE the preceding section on object drawing, there is practically no new principle involved here. The exercises are naturally more difficult in themselves, but they break no new ground. The fundamental idea remains the same. Suitable natural forms are selected and carefully drawn, either directly with the brush, or first in pencil and then tinted with colour. Many of them are afterwards adapted to pattern.

General Principles.

There is, however, a somewhat greater variety of expression in this stage. Take the exercises on Plate IX., for example. The catkins (Fig. 7) are partly done in strong colour directly with the brush, partly shaded in pencil, and partly with tint of colour. The light feathery nature of the blossom could not well be expressed by a solid mass of heavy colour. This portion was therefore lightly shaded with the pencil, and then a light tint of colour passed over the whole. The stalk was then put in with strong, dark colour. This must not yet be confused with "painting," though it is undoubtedly a step nearer to the complete realization of the natural form, which will be attempted at a later stage. A somewhat similar idea is illustrated in the details of the violet (Figs. 8, 9, and 10), where the pencil plays a most important part in the rendering, the mass being simply a tint within the previous pencil outline. The sycamore seeds (Figs. 2 and 3, Plate XII.) are rendered in two ways. Fig. 2 was first carefully drawn in pencil and then tinted; Fig. 3 is a direct brush drawing. Figs. 13, 14, and 15, Plate IX., show yet another style of work; the outlines here were drawn with the brush, instead of with the pencil. How suitable this is for certain things the drawing of the narcissus (Fig. 15) shows; but it requires considerable practice to do it well. Many other examples are given, where, by means of strong solid colour, light tint, and outline combined, the character and structure of the natural form are rendered. See the campion, buttercup, harebell, dragon fly, and clematis on Plate X.; the wild rose, the dahlia, and the tobacco plant on Plate XI.; the samara, the teasel, and the shells on Plate XII. These are an intermediate stage between the simple silhouette, or outline, and painting proper. There is all the "drawing" and structure, but they lack the colour, the light and shade, the "modelling," which complete realization demands. However, this is a distinct step towards the latter. The principles involved in drawing these are identical with those explained in connection with the line drawing; the material only differs.

Arrangement of Plates.

There is another change, too, in the arrangement of the plates. They illustrate typical forms of spring, summer, autumn, and winter respectively. So much is now done in the way of nature study that it was considered advisable to show, in a measure, how it could fit in with a course



of brush drawing. Naturally, however, it destroys to a certain extent the gradation of the exercises, and throws the onus of this on the teacher. In most places the educational school year now commences after the summer vacation, so that the examples of late summer or early autumn would first be taken. At any rate, from the end of August to the end of October there should be no difficulty in getting the buttercup, harebell, clematis, hips, dahlia, plums, nuts, etc., during some portion of the time. Plenty of gradation of exercises can be obtained within these limits, both as far as the example goes and with regard to what is attempted. For instance, the plum, with its simple contour (Fig. 12, Plate XI.), would naturally precede the nut (Fig. 15), with its complicated husk; the clematis bud and leaf would precede the flower; the hip is simpler than the dahlia bud; and so on. Then, again, a single flower of the buttercup may be done instead of the spray shown in Fig. 5, Plate X., or indeed a part of any of these examples instead of the whole. It is far better to take a portion and do it really well, than to attempt the whole and do it badly. In this matter time comes in as well as skill, especially in our elementary schools. The lesson probably never exceeds an hour, and with perishable things it is essential that they should be finished at one lesson. They cannot be kept until the next lesson; and even if they could, the time taken in setting them up just as they were at the previous lesson would be very considerable. These are practical difficulties which one has to face daily. Shells, seed pods, and such like durable things may, of course, have more than one lesson devoted to drawing them if necessary.

In some cases the natural growth provides its own gradation. Thus the winter buds of the horse-chestnut and sycamore (Fig. 11, Plate XII.) are in themselves easier than at a later stage in the spring, as in Figs. 13 and 14, Plate IX. A week or two later and these buds, having begun to burst, will provide yet more difficult exercises. The gradation of the exercises must therefore be left to the discretion of each teacher.

Typical Brush Strokes.

The typical brush strokes also advance a step further in this stage. Not only are the curves more subtle in themselves, but an attempt is now made to show a "turnover" of the stroke. These strokes have a twofold use—they not only combine to make very pleasing and interesting pattern, but they are of great service in developing facility in the use of the brush.

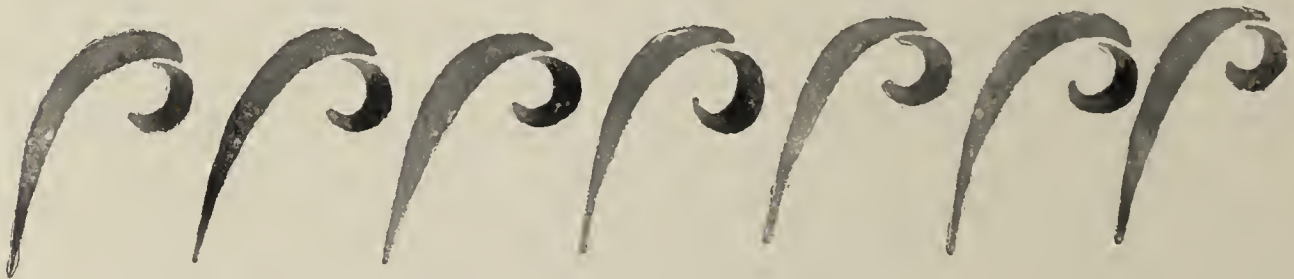


Fig. 39.—Typical brush strokes for drill work.

They should be practised constantly at nearly every lesson. Take a different stroke each time, and let the pupils try to master it. Thirty or forty strokes can be done in five minutes. They should, as far as possible, be the result of one effort of the hand. Practice

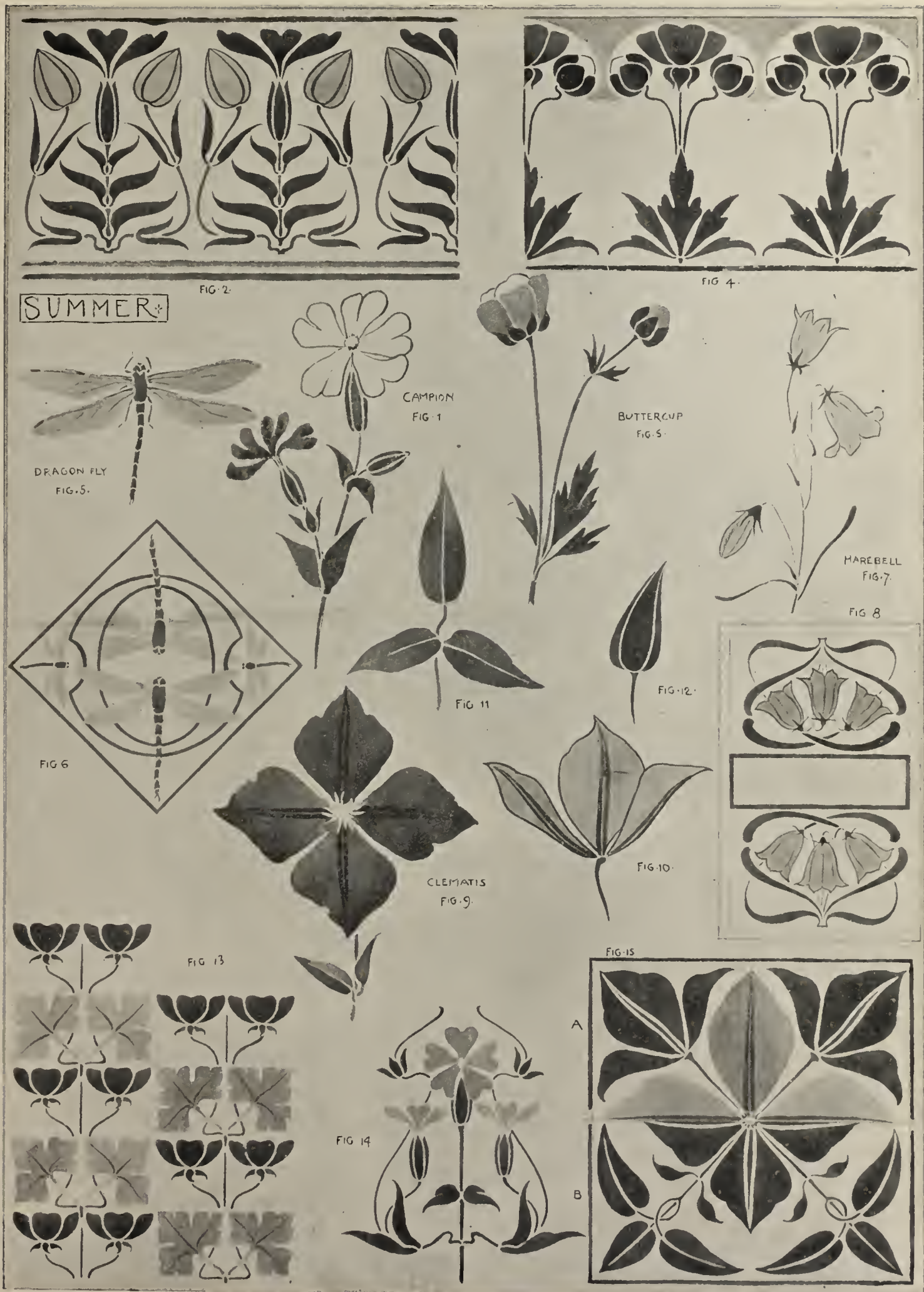




Fig. 40.—Typical brush strokes for drill work.

work of this kind fails if it is done laboriously. Any odd scraps of paper serve to practise on, but it is work that must be done if success is to be attained in the subject. Five or six lines like Figs. 39 and 40 should easily be done, *to twice this scale*, in ten minutes, if the proper method is adopted. It is still essential to hold the brush in the

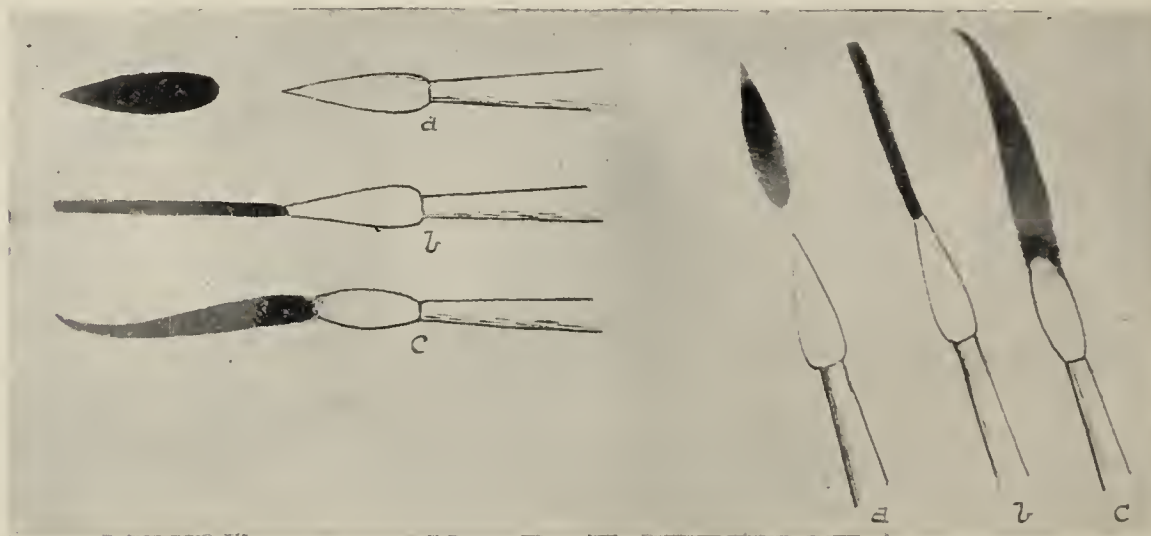


Fig. 41.

Correct method of using brush.

Fig. 42.

correct way, so that the strokes trail after the brush, as it were (see Figs. 41 and 42). If the brush gets across the stroke, as in Fig. 43, the result is sure to be a failure.

Figs. 44, 45, and 46 show the gradual development of these strokes from the simple brush impression onwards. This brush impression is the true precursor of all that

follows. It has been overrated in many cases, and underrated in others. Used legitimately, as a most elementary introduction it fulfils a useful purpose. These strokes are of great service in representing natural forms too. One has only to glance at the plates to see how often one or other of them are brought into use, and

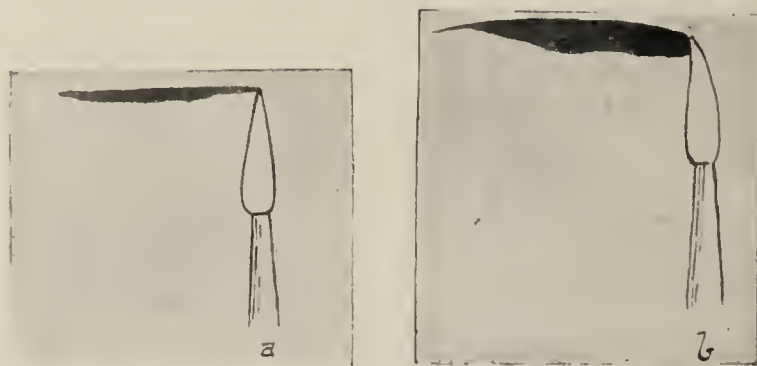


Fig. 43.—Incorrect method of using brush.

how facility in making them would conduce to "slick," rapid work, as far as brush "drawing" is concerned.





Fig. 44.—Typical brush strokes. (Stages I., II., and III.)

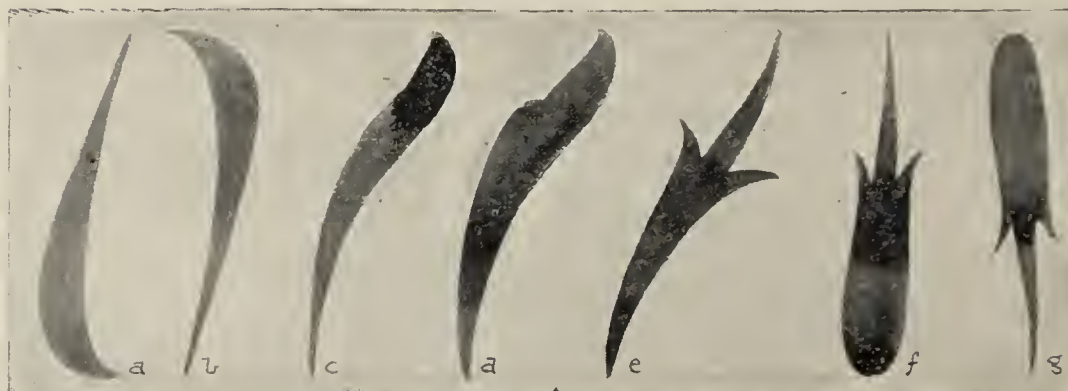


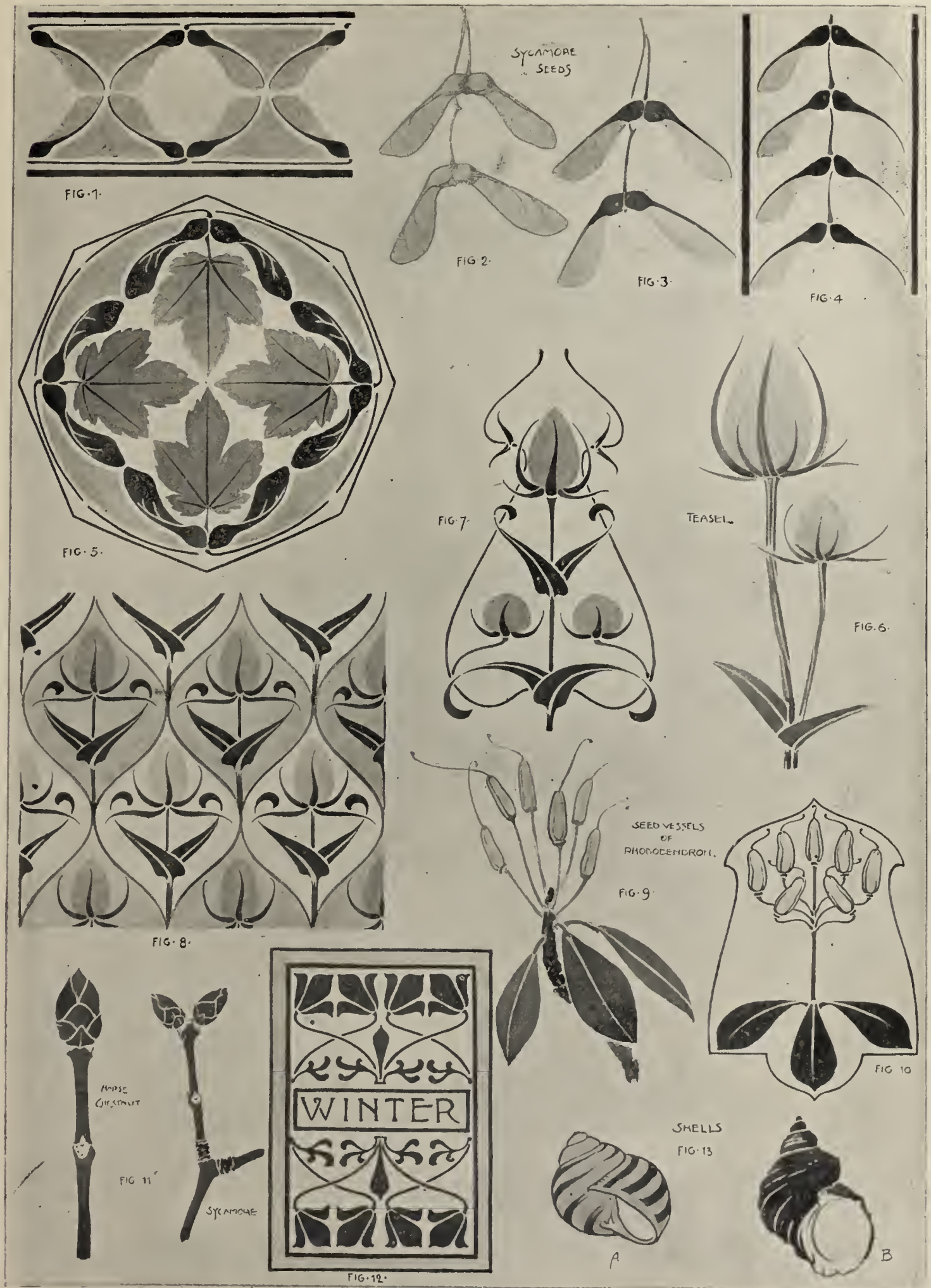
Fig. 45.—Typical brush strokes. (Stage IV.)



Fig. 46.—Typical brush strokes. (Stage V.)

Practical experience has shown that a too exclusive use of **Pattern Work.** drawing from nature engenders a looseness of expression. There is, of course, no real reason why this should be so; but the natural forms being so varied and irregular, the detection of errors is made more difficult than in the case of "tighter" forms. The pattern work, being "tight," carries its own conviction

PLATE XII.



Stage V.]

BRUSH DRAWING.

[Winter.

with it. The pupil sees at a glance that the units do not balance, or that the spacing is all wrong. From the mere point of view of "drawing" alone, pattern work is invaluable, and checks most effectually any tendency to looseness in drawing. But it does far more than this: it enables the pupil to develop originality, as far as arrangement goes; to cultivate the sense of beautiful line, form, and colour. Not that these elements of beauty are lacking in nature, but that they can be more idealized in the making of pattern.

Two or three things must be borne in mind in making pattern. All good pattern is the result of an orderly arrangement of more or less simple elements. There must be no haphazard placing of isolated units here and there, having not the remotest organic connection with each other. If a natural form is being adapted, the first thing to do is to simplify it—to make a typical, rather than a particular specimen; to eliminate all details that are unnecessary, or which would lead to confusion. This process is sometimes spoken of as conventionalization. The form is then repeated, to make a simple border, as Fig. 3, Plate IX., or to fill a square (Fig. 4), a circle (Fig. 17), etc. There is absolutely no limit to the number of arrangements that can be made, from very simple to very intricate and complex pattern. Yet the fundamental principles are few. The natural growth should never be violated; the ornament should recognize—that is, should generally follow—the contour of the space it is filling, and suggest the geometrical form. See, for example, how the violets in Fig. 12, Plate IX., are arranged to fit the leaf form; how the leaves in Fig. 17 are arranged in such a way as to provide a suitable space for the flower. It is not necessary to crowd the figure with ornament; sometimes the space is just as valuable, and may even be emphasized, as in Figs. 4 and 17, Plate IX.; Fig. 9, Plate XI., etc.

Too much must not be expected from scholars in the matter of originality. The base form, leading lines, and details must, as a rule, be given; the most the scholars can do is to make pleasing original arrangements. The substitution of one set of details for another is sufficient to effect this purpose. For example, "leading lines" like Fig. 47 form the basis of a pattern on each plate. On Plate IX. these lines are clothed with details derived from the anemone, on Plate X. from the campion, on Plate XI. from typical brush strokes, on Plate XII. from the teasel. The buttercup, clematis, wild rose, harebell, or dahlia may also be adapted to these curves. Not so, however, the crocus, violet, or samara; these are obviously unsuited to such an arrangement of lines, as far as the natural growth is concerned.

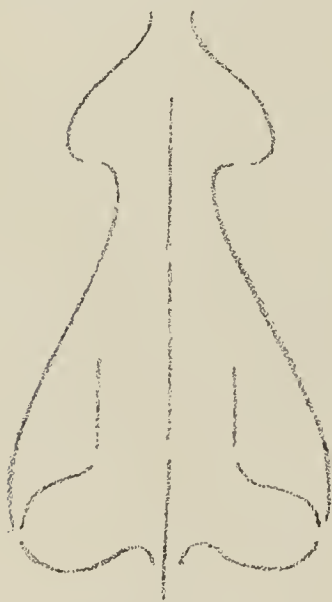


Fig. 47.

Some use of the pencil, as suggested in Stage IV., must be made use of in connection with this pattern work. The main lines would be lightly suggested with the pencil; for example, the borders Fig. 3, Plate IX., or Fig. 2, Plate X., would need preliminary pencil sketches like Figs. 48 and 49.

All the geometrical bases should be drawn carefully with ruler, set-square, and compasses. This mechanical work is quite as important in its way as the free drawing.



FIG. 1.

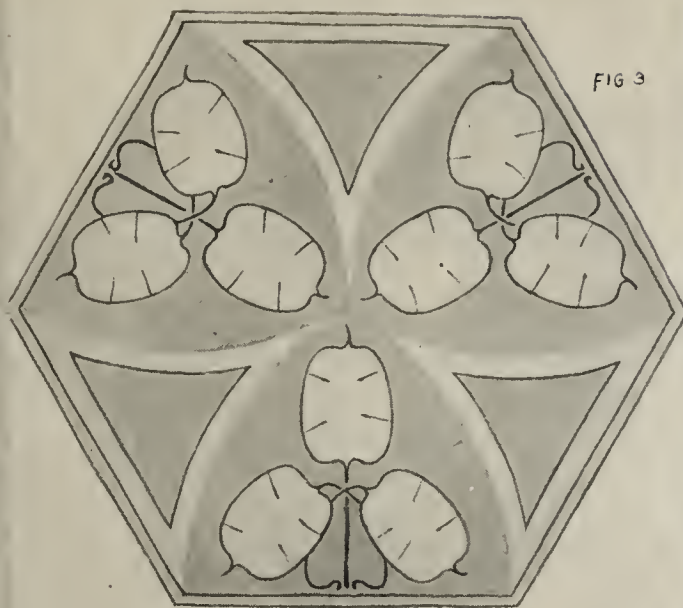


FIG. 3

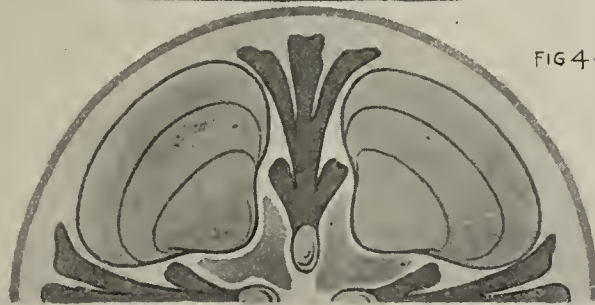


FIG. 4.



FIG. 2.



FIG. 5.



FIG. 6.



FIG. 7.

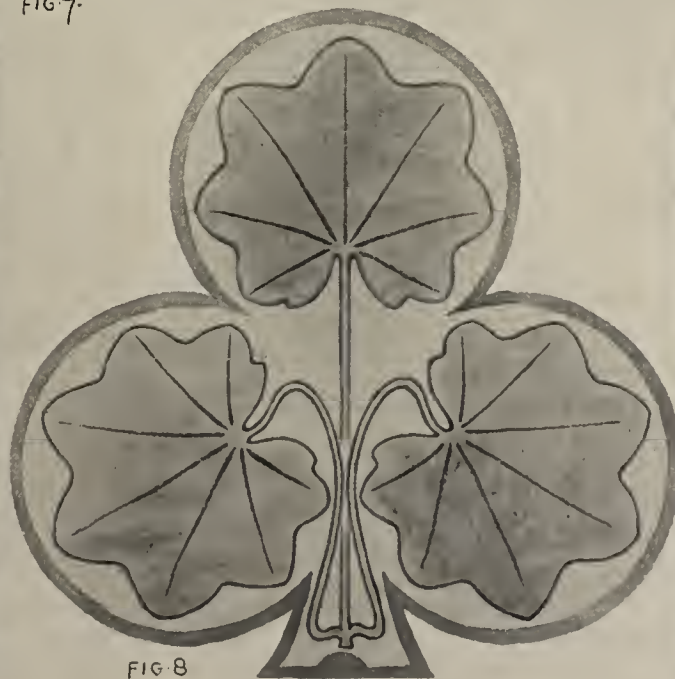


FIG. 8



FIG. 9

- The construction of the various figures will take the place of much of the old plane geometry, bisecting angles, dividing lines, and so on. It is of a far more practical character.

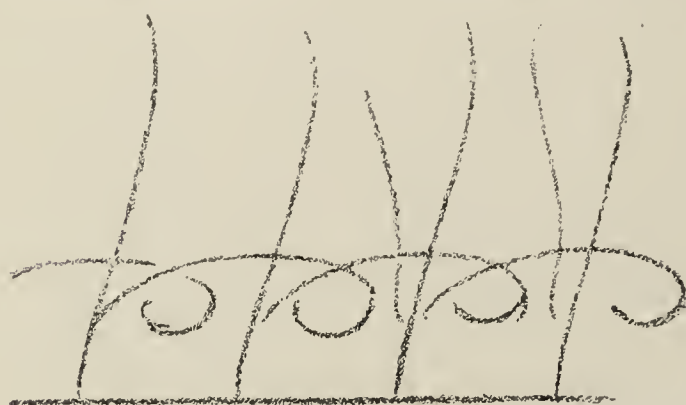


Fig. 48.



Fig. 49.

Preliminary pencil sketches.

Colour is an important feature of brush drawing, and is well worth study on its own account. The effect of much good drawing is often quite spoilt by being allied to muddy colour. The proper methods of using colour were fully explained in the earlier stages of this series. They should be carefully followed, and every attempt made to obtain good colour as well as good drawing.

The flat tinting may be taken as a section of the brush drawing.

Flat Tinting. It is really only a question of the method of expression. The same details are used as in Plates IX., X., XI., and XII. The mechanical setting out is first done very carefully with instruments, and then suitable forms selected to fill the spaces, or suitable spaces made to take the particular units. Sometimes the "setting out" of two entirely different patterns, as far as appearance goes, is identical. Figs. 1 and 2, Plate XIII., for example, are both arranged in squares; Figs. 5 and 6 are a continuous line of circles touching each other (see Fig. 50); Fig. 8 is constructed on

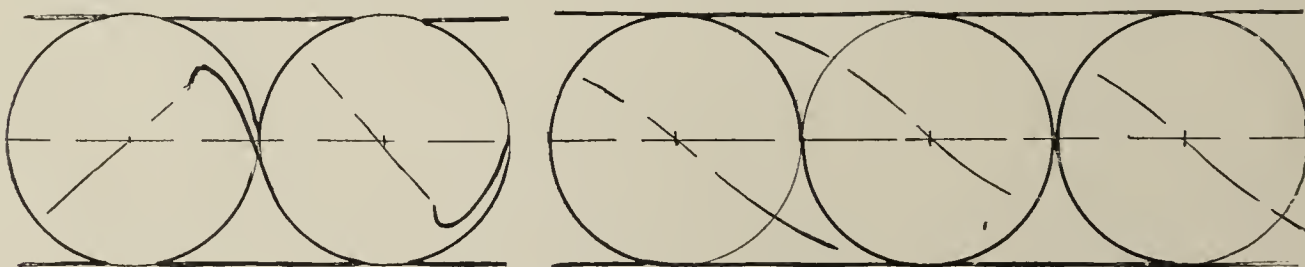


Fig. 50.—Geometrical base or "setting out," for Figs. 5 and 6, Plate XIII.

the equilateral triangle as a basis; Fig. 1, Plate XIV., is four circles in a square; Fig. 3 needs three circles within a circle. The pupils thus get plenty of work in practical geometry.

The material for most of the patterns is derived from the leaf forms shown on page 29. Before adapting them to pattern, they should first be carefully drawn from nature. Where several repeats have to be made, it is best to sketch one unit on a separate piece of paper, and then transfer it to a clean sheet with tracing paper. This keeps the surface of the paper for the finished drawing clean, and suitable to work on with delicate washes of colour. It is a task beyond most scholars to make drawings such as those



FIG. 1.



FIG. 2.



FIG. 3.

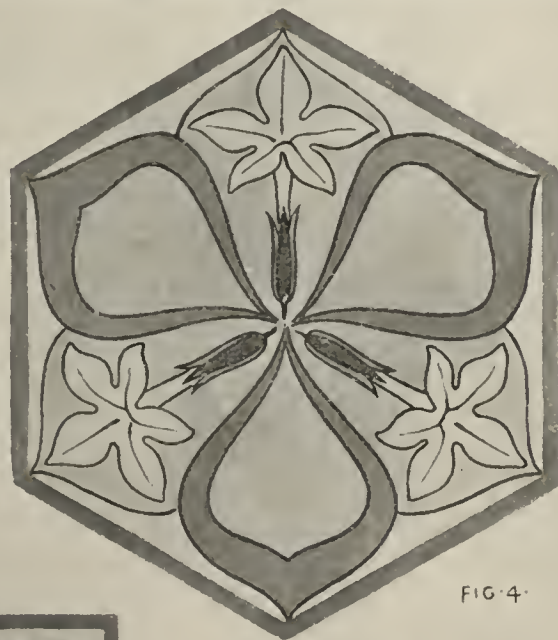


FIG. 4.

FIG. 6.

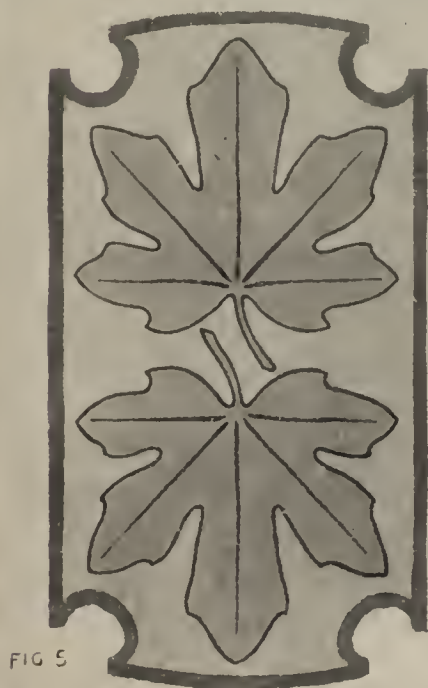


FIG. 5.

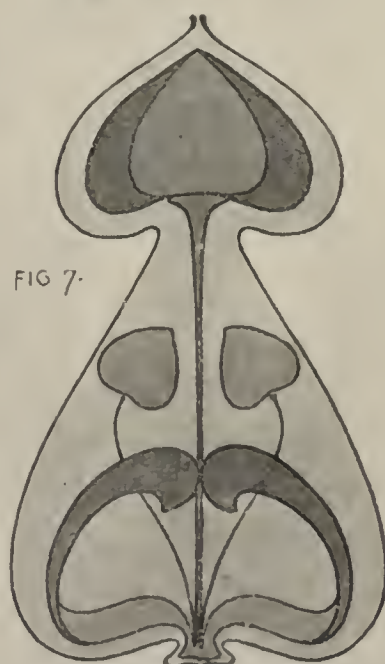
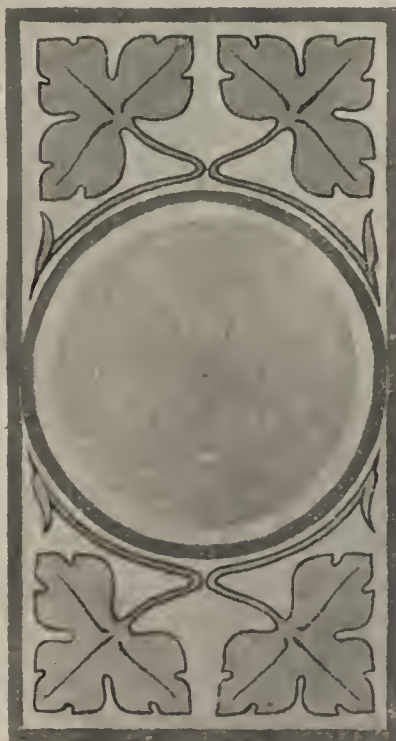


FIG. 7.

shown in the plates, and keep the surface of the paper in good condition at the same time.

In practical work it is best to arrange the colour scheme so that a continuous wash of thin colour may be passed over the entire space. The ornament or the ground is then made somewhat darker by the addition of a second tint, either of the same colour or of some allied hue. For example, if the ground wash is a tint of crimson-lake, the ornament may be in darker tones of red or red-brown; but it would not do to put a wash of green over the pink—the result would most likely be a dirty gray.



Fig. 51.—Putting on a wash of colour.

Putting on a Wash of Colour.

In these exercises so much depends upon getting good, clear, transparent colour, that the main points necessary to secure this are repeated.

1. *The colour must be thoroughly well mixed*, and, for the first layer at least, should be very thin. As a rule, the best plan is for the teacher to mix the colour for the first few lessons. This secures an evenness of tint throughout the class, and teaches the children just what the strength of colour should be for the purpose. Some colours are more insoluble than others, and need more mixing.

2. When the colour is quite ready, take the large camel-hair water-brush and cover with clean water the space to be tinted. Blot this off at once with the blotting-pad, leaving the surface *damp*, but not wet. There is no necessity to keep the water just to the edge of the drawing; it will not hurt if it goes outside the space.

3. Lay on the colour immediately afterwards with the Siberian or sable brush. Be careful to stir up the mixture in the palette whenever a fresh brushful is taken.

The paper should be slightly inclined. Let the brush be thoroughly well charged with colour. The smudgy, uneven washes are frequently due to working with a dry brush. Commence at the top left-hand side of the space, and draw with broad strokes, using moderate pressure. Leave no spaces between the strokes, but let each one overlap the previous one to some extent. It is best to do the edges a portion at a time, as shown at Fig. 51, and then fill in the space between them. The colour must, however, be kept quite wet all over. The darker portions at the base represent the amount of colour being used. When the bottom of the space is reached, there is generally some superfluous colour to be got rid of. Draw the brush across the blotting-pad to exhaust the colour, and it will then readily take up the excess. Sometimes it is best to work in a downward direction, as at Fig. 52, and this has the advantage of working in the same way as the natural flow of the colour.

One or two negative points may now be dealt with. Fig. 53 shows what to avoid—namely, working with a dry brush, and leaving spaces. The colour surrounding these spaces would soon become dry, and any attempt to fill them in could only result in making smudgy patches. Whenever a wash of colour has been laid on, it should never be touched again until quite dry. There is often a great temptation to put on a little more colour here and there where the surface looks rather lighter; this should never be done. If the wash really is uneven, such touching can only make it worse; and the chances are that, though it looks uneven while wet, it will dry quite smooth. Should the tint turn out patchy, the colour may be washed off with the water-brush and the whole process gone over again, or another drawing must be done.

When it is necessary to put one colour over another, the same three rules as given

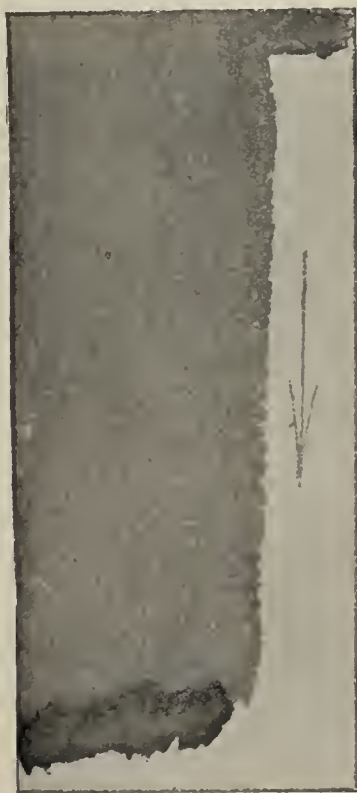


Fig. 52.



Fig. 53.—Wrong method of working.

previously must be adhered to. The under tone must, of course, be allowed to get perfectly dry. Similarly, when two colours have to be placed side by side, the first one must be quite dry before the second one can be laid on, otherwise they will run together.

It is very difficult to keep perfectly sharp edges when putting on large washes of colour. They will nearly always need outlining, as shown in the examples. This *may* be done with pencil, but it looks far better done with the brush. The large sheets give an indication of how this should be done. These outlines need not be fine wiry lines; if they are kept even in breadth and unobtrusive in colour, they may be drawn fairly broad.

In practice the examples should be drawn at least twice the size of the illustrations in the plates.

MODELLING IN CLAY

IN modelling, as in brush drawing, there is very little more to enter into in this stage as far as principles are concerned. The examples given are more difficult in character, and show more details than those suggested for Stage IV., but the method of working remains the same.

It is very essential that the proper drawing should be kept.

“Drawing.” This is a point which is often totally ignored in modelling. The very nature of the material, which permits of the form being altered at will, engenders a looseness of “expression,” and one frequently sees a model so pulled about with the fingers, and scraped and cut away with the tool, that there is no true “modelling” in it. If the same method were adopted in drawing with pencil, pen, or brush, the result would be disastrous; yet “modelling” needs just as much “drawing” as these. There must be careful and accurate *observation* of the form before any attempt is made to reproduce it, no matter what the medium may be. When the form is known, the reproduction or “expression” should be done deliberately, and with the certainty which only a thorough knowledge of the form can give. There need be no putting down

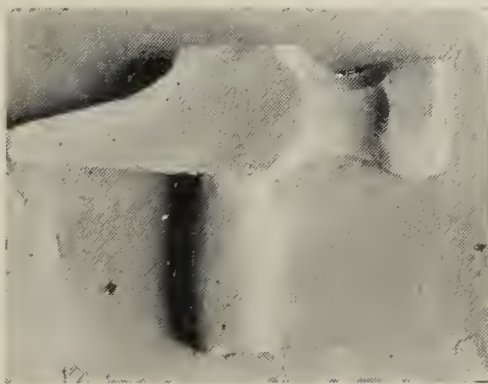
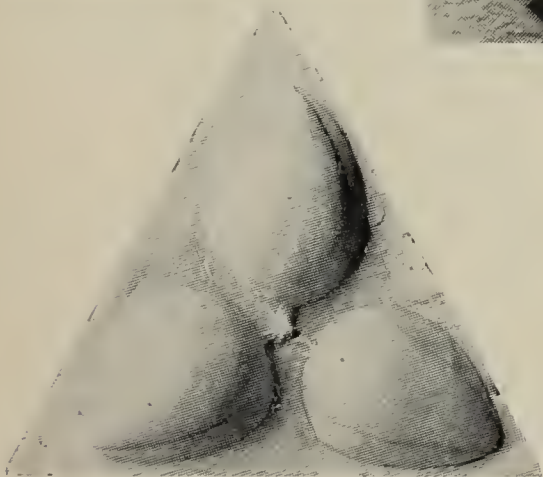
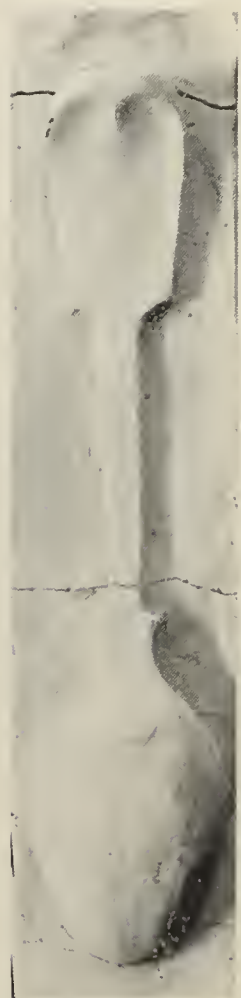


Fig. 54.—Stages in modelling Fig. 10, Plate XV

of either lines or clay in a careless or haphazard way, in the hope that the work will come right somehow. I cannot emphasize this point too strongly. Just in the same degree that the faculties of *observation*, *recollection*, and *reproduction* are cultivated or neglected, so will the work be good or bad, be the material what it may. In clay modelling, unlike other branches of the work, we are dealing with actualities rather than with appearances, and not only the outline, but the relief as well, must be correct.

The outline, however, must receive attention, though we shall not express it here

PLATE XV.



Stage V.]

MODELLING IN CLAY.

[First Period.

as a line. In common with all other drawing, if the outline is incorrect, no matter how careful the subsequent modelling may be, the result as a whole is inaccurate. See, therefore, that a correct outline is obtained first. In cases where the edge of the model rests upon the clay slab, as in Figs. 1, 2, 4, 6, 7, 8, 9, 10, in Plate XV., and many others subsequently, it is better to secure this edge at once. Do not begin in the middle and spread out the clay to form rough edges, and then try to get the outline by cutting and scraping with the tool; this generally leads to very poor work.

At this stage it is best to proceed as follows:—Make the slab as required, and then lightly, but very carefully, sketch the form with a light, incised line. Lay a thin strip of clay to coincide with this line, and press this with the finger into the exact position. Fig. 54 (*a*) shows this strip laid on the incised line, and partly pressed into position. In this way the edge is obtained directly, accurately, and clean cut; the tool is needed very, very little, if at all. No subsequent modelling need disturb this accurate



Fig. 55.—Stages in modelling Fig. 7, Plate XV.

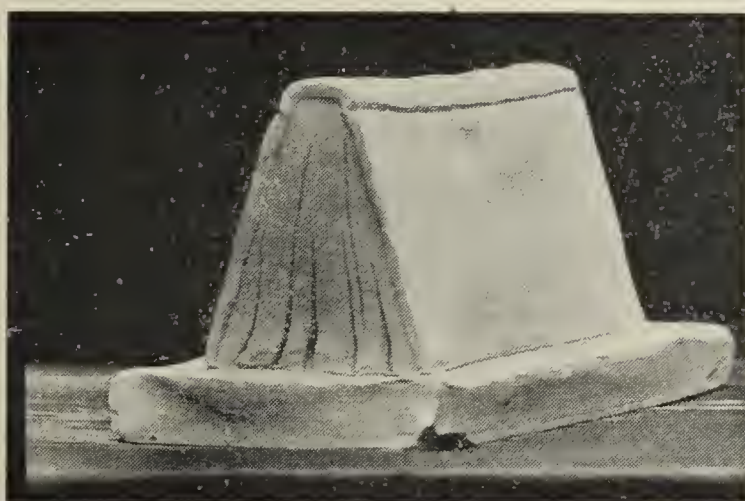
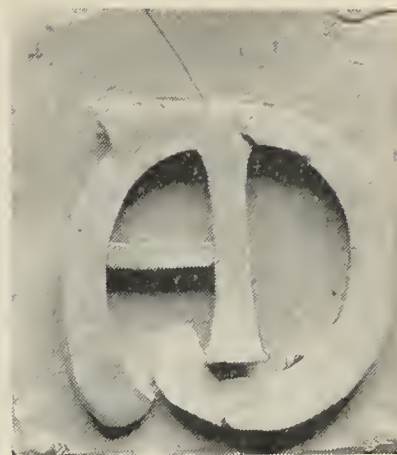
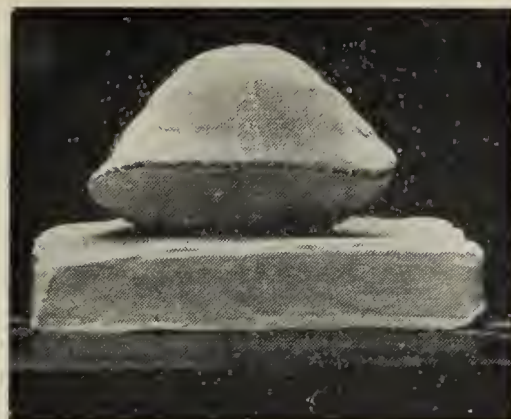


Fig. 56.—First stage Fig. 2, Plate XV.

outline. Now proceed to get the relief. In this exercise it is small, and only requires a little extra clay round the edges and in the centre. Fig. 54 (*b*) shows this laid on and partly pressed into shape. Fig. 54 (*c*) gives the finished leaf. Fig. 55 shows the same principle in working out Fig. 7, Plate XV. The triangular slab is first made, and the forms lightly suggested upon it. The outline of the buds is then secured in each case by a strip of clay, as shown at the top. Do this for all three before proceeding to obtain the relief; it is far easier to get good, clean edges while the strips only are in position than when the relief is put in. It is also an advantage to put on the small stalks now, as the centre is not easy to get at when the bud forms are complete. The next step is to get the general relief as shown by the bud at the left-hand corner. Do this in all three, before proceeding to put on the final piece which suggests the middle petal.

These two examples are typical of many others shown in the plates; successful modelling will only come by such careful and methodical work.

PLATE XVI.



Stage V.]

MODELLING IN CLAY.

[Second Period.

The same method can be employed in the case of many details too. Take the tulip (Fig. 2, Plate XV.), for example. Make the slab and the "core" of the tulip as

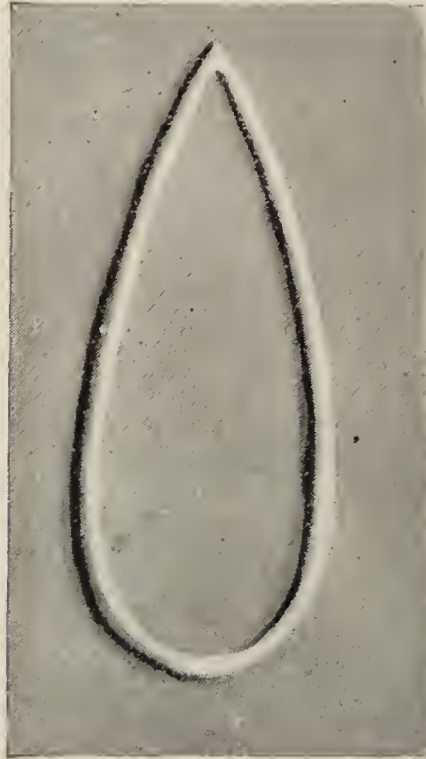


Fig. 57.—Securing a correct outline.



Fig. 58.—Space filled in.

before. Then lay a strip of clay to indicate the slightly-raised petal on the left, and press this with the finger into the exact position. Lay a similar strip for the petal on the right. Having obtained the edge, the subsequent filling is not difficult.

In the case of those models where the edges do not touch the slab—such as Fig. 5, Plate XV.; Fig. 2, Plate XVI.; and so on—the preliminary shaping is done with the hands, and the lump of clay firmly fixed on the slab. A peg of wood stuck in the

slab and into the model helps to make the latter more secure. The details and markings are then modelled in the usual way. For this purpose the clay should be on the soft side, so that it readily yields to gentle pressure. If it is too hard, the model is constantly being pressed out of shape.

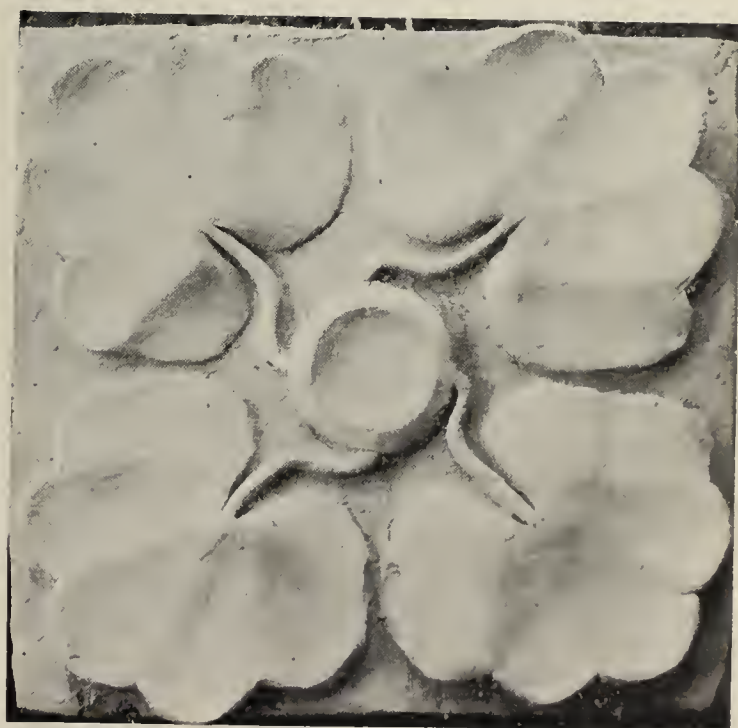
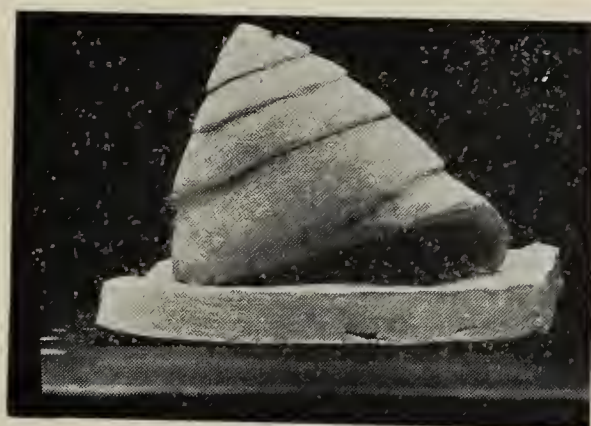
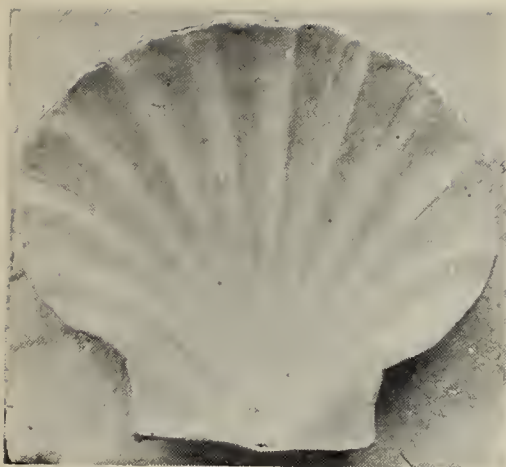
Figs. 57, 58, and 59, taken from Miss Unwin's articles in *The Practical Teacher's Art Monthly*, show very clearly the methods of working.



Fig. 59.

In describing the method of working these typical examples, no mention has been made of the use of the tools. Though as little use as possible should be made of them, they are indispensable. With all one's care in obtaining the outline, the edges will get ragged here and there, and the tool must be used to correct the error, in much the same way as india-rubber is used to correct

PLATE XVII.



Stage V.]

MODELLING IN CLAY.

[Third Period.

pencil lines. The chisel end of the tool should be used for this purpose, and the clay gently pressed down into the slab, or the tool lightly drawn along the edge. Again, the sharp ending of the crocus leaf (Fig. 4, Plate XV.) could scarcely be done with the fingers alone; the tool is needed to get the drawing at the point. So with markings such as the small flutings on the cockle shell (Figs. 1 and 2, Plate XVI.); these are too narrow to be made with the

The Use of the Tool.

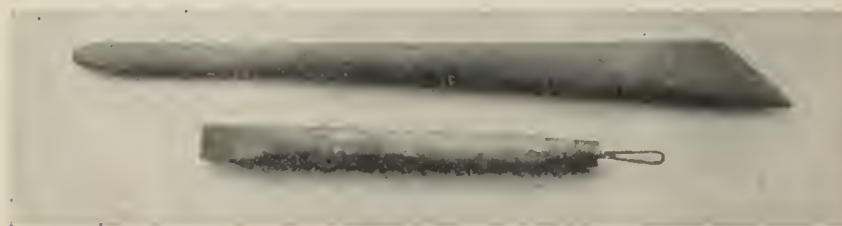


Fig. 60.

finger, but the rounded end of the tool does the work admirably. The small wire loop (Fig. 60) is also of great service in removing small pieces of clay when necessary.

The small indentation at the tips of the narcissus petals (Fig. 4, Plate XVI.) and the spaces at the centre could easily be cleared in this way. The proper use of the tools should be taught, but their abuse must be guarded against.

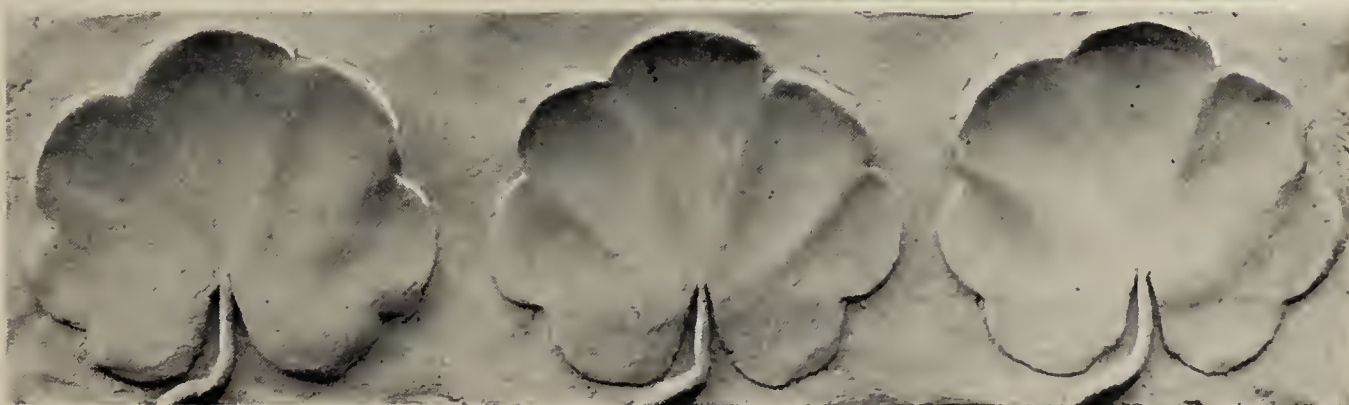
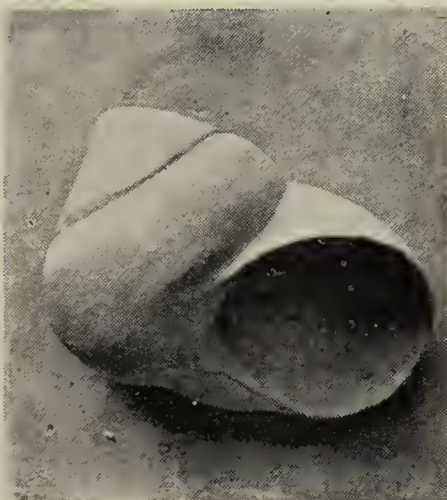
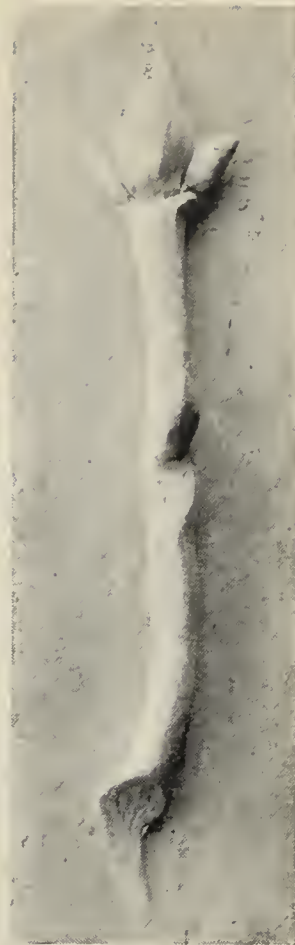
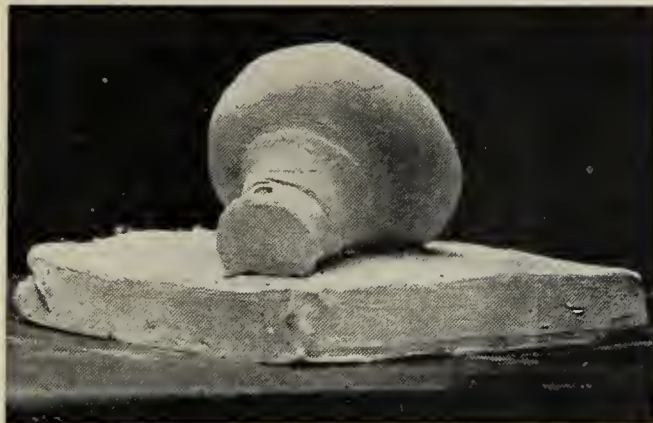
Illustrations in the Plates.

The selection of examples has been made on the same lines as before. Many of the models have been used in other sections. The crocus, for instance, is given as an exercise in outline drawing, in brush drawing, and here in modelling. It is further adapted to pattern by direct brush drawing, by tinting, and by modelling. So with many other natural forms; they will be found expressed in all three mediums—pencil, brush, and clay. In some cases the self-same example was worked, as the tulip leaf (Fig. 5, Plate I., and Fig. 5, Plate XV.); while in others a different specimen was selected, as Fig. 3, Plate I., and Fig. 4, Plate XV. It must be admitted that, as far as modelling is concerned, such examples as the crocus, the tulip leaf, etc., are somewhat difficult, especially for town schools—they so soon droop and wither. In the country, with abundant supplies of fresh material, there is no difficulty. Town schools can fall back upon such things as shells, winter buds, seed pods, and such like, which are very durable. Again, the manual-training workshop will provide some excellent examples—such as the hammer head (Fig. 8, Plate XV.), the gouge (Fig. 7, Plate XVI.), etc. These rigid forms give capital training in accurate and precise work, and provide a useful corrective against the freedom of natural forms: many of them are not without some beauty of form too. The spoon belongs to the same class of work, and each child could easily bring one as a model.

The aim has been to provide an all-round training by selecting natural forms, which allow the greatest freedom of expression; manufactured objects, which demand rigorous accuracy; and pattern work, which occupies a somewhat intermediate position. If the examples throughout the book are used as suggestive, a course to suit any school could readily be devised.

Remember that one of the greatest aids to successful school work in modelling is to keep the clay in good condition. This is absolutely imperative if good work is to be accomplished.

PLATE XVIII.



Stage V.]

MODELLING IN CLAY.

[Fourth Period.



THE importance of mechanical drawing has been insisted upon in every stage throughout the course. In Stages I. and II. the work mainly took the form of preparing bases for pattern, either for brush drawing or line drawing, or in connection with the "paper work." In Stage III. the training was continued in the same way, with the possible addition of modelling in paper. Up to this point direct measurements only had been dealt with. Stage IV. continued all the previous work, and introduced "drawing to scale." By this time the pupils should be able to handle rulers and set-squares with facility, and to work neatly and accurately. The essence of all the "technical" side of drawing is its accuracy. It is far easier to obtain uniformly excellent results in this subject than in free drawing. A teacher can almost insist upon the scholar producing neat and accurate work. A good H pencil should be specially kept for all the mechanical drawing. The necessity for scales and their practical use were explained in Stage IV. No new principles are involved in the present stage. The scales are carefully constructed as before, and all drawings made from actual objects.

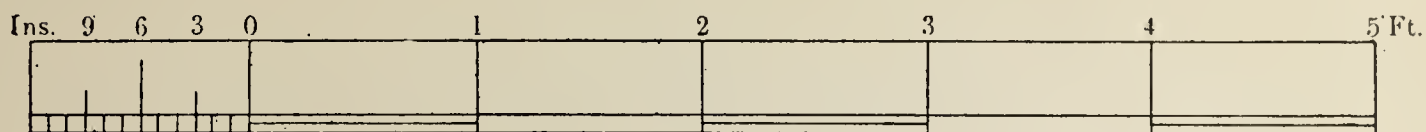
**Construction
of Scales.**

Various practical suggestions in connection with the scales were made in Stage IV. The chief thing, of course, is to have them absolutely accurate. Probably half a dozen scales, such as those shown on Plate XIX., will be sufficient for all the exercises the pupils will be called upon to do at this period. The first two are suitable for fairly large objects, such as cupboards, doors, windows, etc.; the next scale, $1\frac{1}{2}$ " to 1', for somewhat smaller things—pictures, maps, charts, drawers, desks, and so on; the scale of $\frac{3}{4}$ " to 1 yard is suitable for the plan of the classroom, the dividing wall or partition of the room, a portion of the playground, etc.; the last scale is useful when small objects are being enlarged—a common inkwell, a key plate, a matchbox, some of the smaller cardboard models, and such like. There is no lack of suitable objects in any classroom.

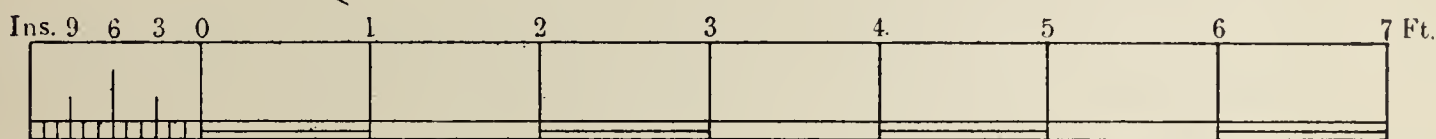
It is a good plan to have a set of scales like these made on a piece of stout paper or thin cardboard, and kept in the drawing books. They are then always ready for use, and the necessity for taking up a considerable portion of the time at the beginning of a lesson in making a scale is done away with; neither need the same scale be made two or three times over.

Note how the units of the scales are obtained. In the first two and in the fourth only four divisions are attempted mechanically. With the instruments at their disposal the scholars probably succeed in getting the separate inches more accurate in the way

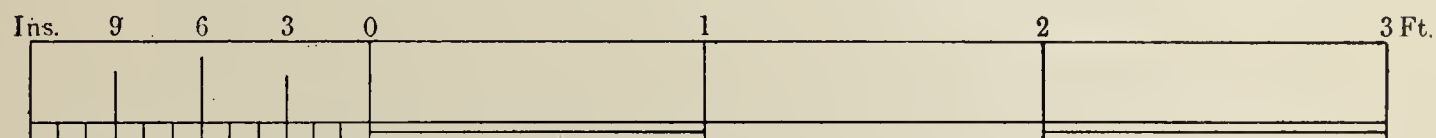
PLATE XIX.



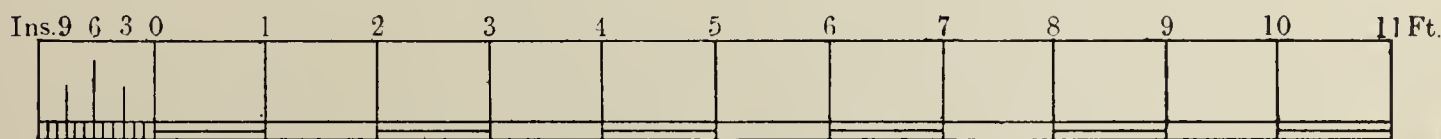
Scale 1" to 1', or $\frac{1}{12}$.



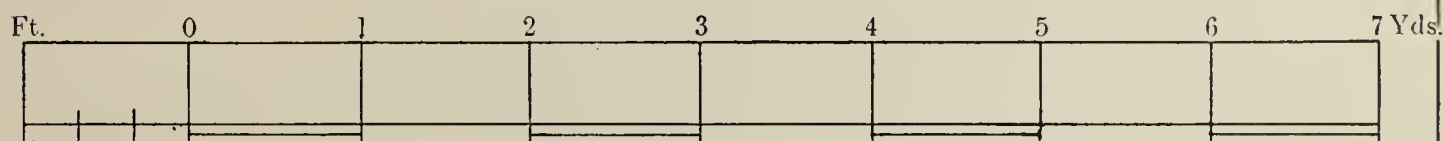
Scale $\frac{3}{4}$ " to 1', or $\frac{1}{16}$.



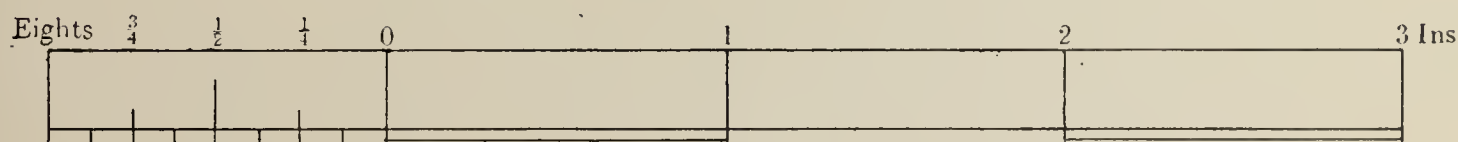
Scale 1 $\frac{1}{2}$ " to 1', or $\frac{1}{8}$.



Scale $\frac{1}{2}$ " to 1', or $\frac{1}{24}$.



Scale $\frac{3}{4}$ " to 1 yard, or $\frac{1}{48}$.



Scale 1 $\frac{1}{2}$ " to 1", showing eighths.

Stage V.—SET OF SIMPLE SCALES.

suggested than if twelve lines were drawn, as in the scale of $1\frac{1}{2}"$ to 1'. In the scale of $\frac{3}{4}"$ to 1 yard no geometrical construction is needed—a quarter of an inch represents one foot. Whatever method may be adopted, however, it is essential that the scales should be neatly and accurately drawn and figured.

Practical Exercises.

The practical exercises will remain much the same as in Stage IV., except that rather more complicated examples can be attempted. Compare Fig. 1, Plate XX., with Fig. 1, Plate XX., Stage IV. It is a similar kind of object, but here more details are expressed. The panels of the doors are shown, thus adding considerably to the work. Similarly with the picture (Fig. 3). The outer frame and the string would have made a good exercise in Stage IV.; but here the narrow gold slip and the size of the picture are also indicated.

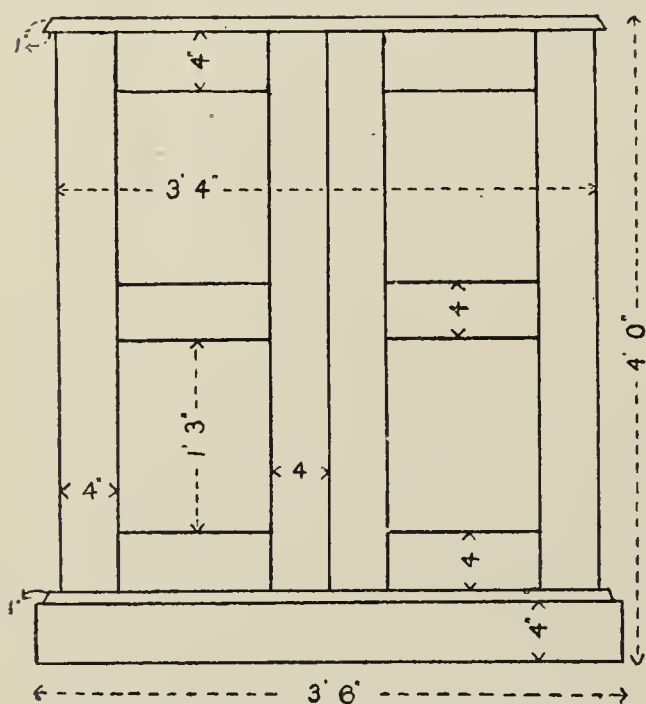


Fig. 61.—Rough blackboard dimensioned sketch.

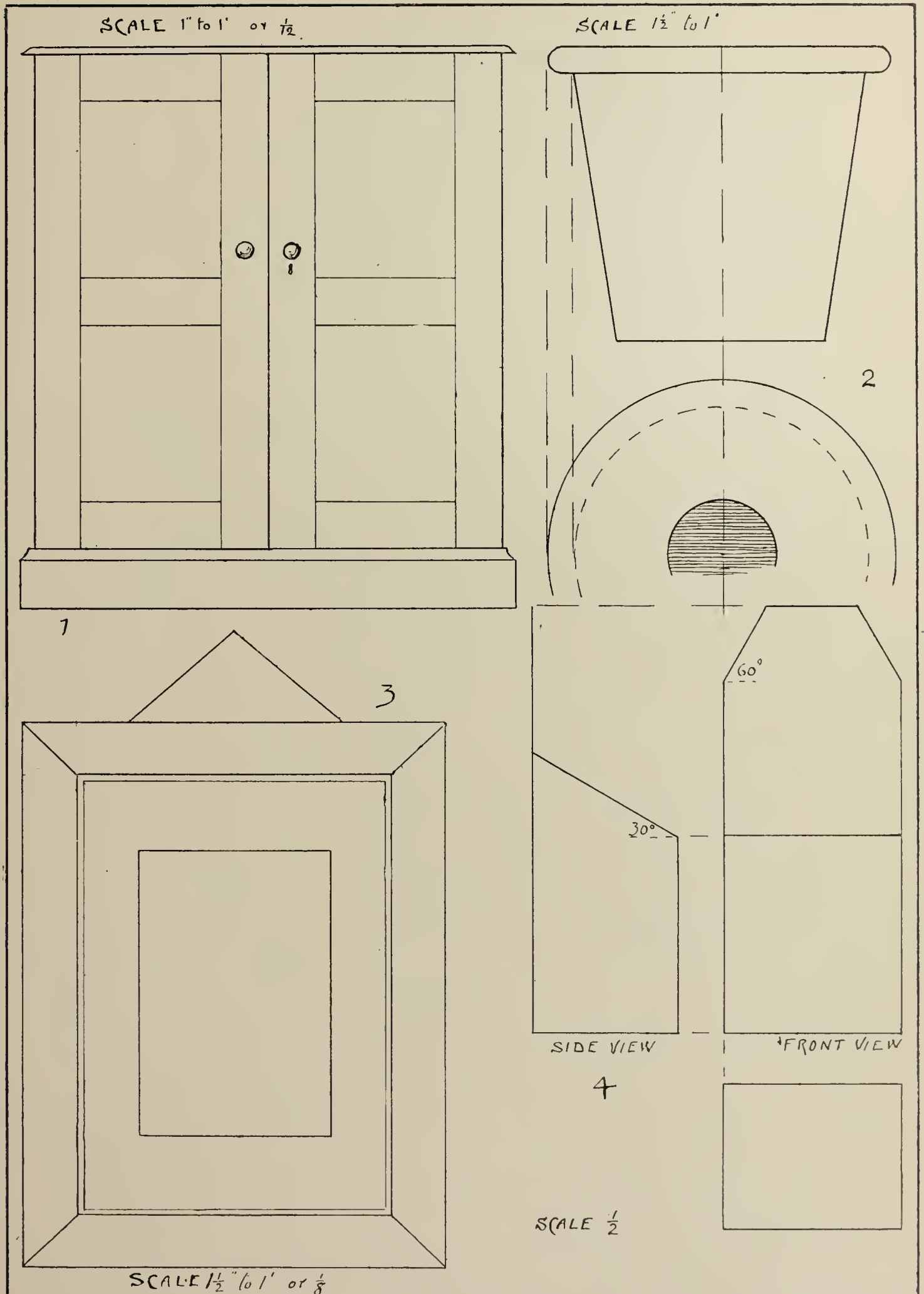
Two or even more views of an object may be drawn without making too much of the "solid geometry." Fig. 2 is a common inkwell. Fig. 4 is the taper holder from Plate XXII. Where cardboard modelling is taken, the models make excellent exercises for scale drawing of this kind.

The work should be made as practical as possible. When an object in the room is being done, allow one of the pupils to measure it; and as the measurements are taken, make a rough sketch on the blackboard, like Fig. 61, indicating the various dimensions. The scholars then make a neat drawing according to the required scale. A similar method can be adopted throughout the entire course. Be quite sure the pupils understand the principles of the work.

In schools where no cardboard modelling, woodwork, or brush drawing are done, some further mechanical drawing in the shape of pattern work may be attempted. The object is to teach the pupils to use drawing instruments neatly and accurately. This work is far more exacting in the matter of execution than ordinary scale drawing. The exercises may be such as can be done with the ruler alone, but generally they should introduce the compasses too. In practice they should be worked to a fairly large scale, not less than twice the size of the drawings on Plate XXI. The construction is indicated in each instance by dotted lines. This basis needs to be most accurately drawn if the subsequent arcs are to fit the spaces.

It is very necessary that the compasses should be of good quality, and the pencil points kept in good condition. No accurate work can be looked for unless these important details receive due attention.

PLATE XX.



Stage V.—DRAWING TO SCALE.

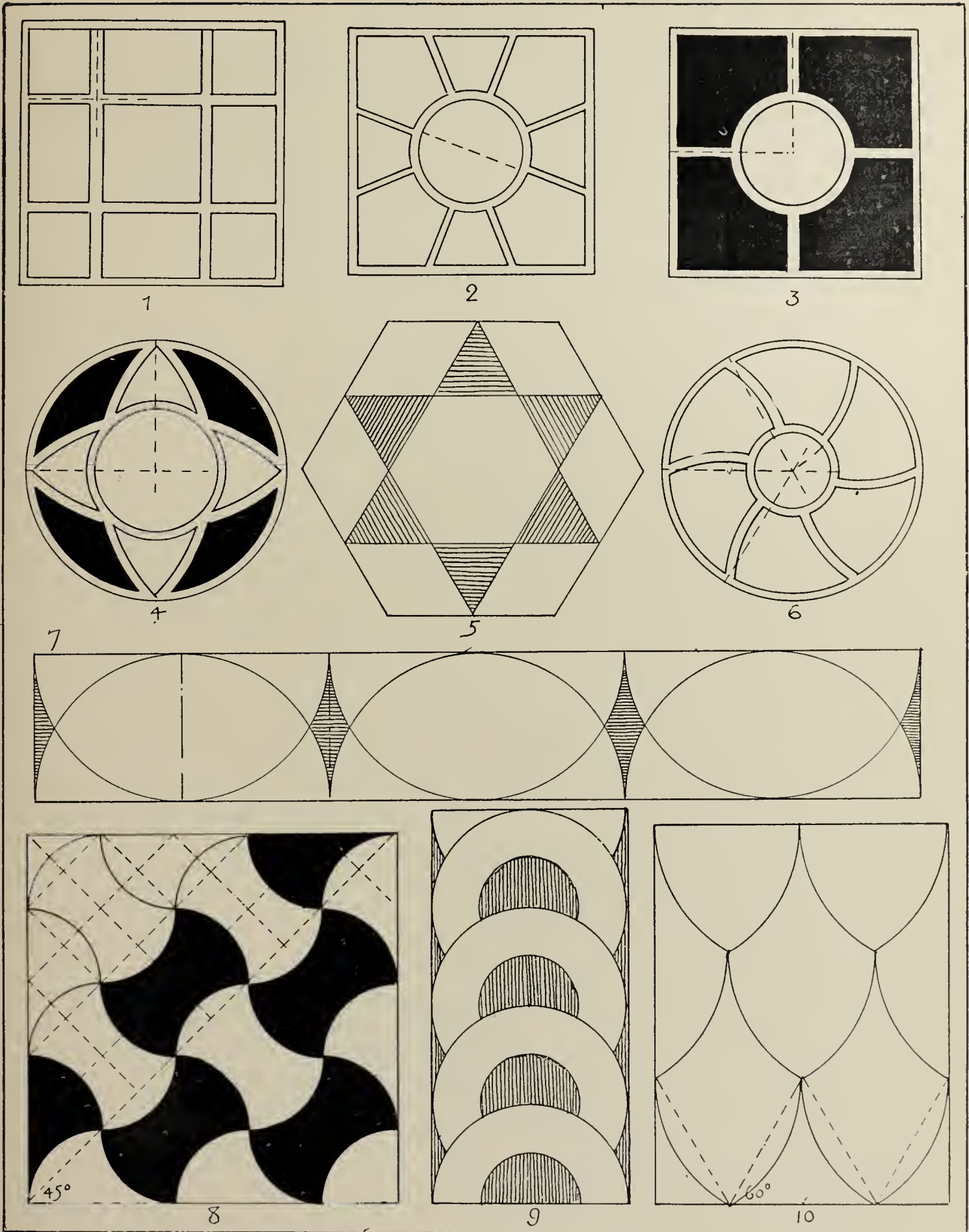
The pattern can be further developed by lines, as in Figs. 5, 7, and 10, or by tints, as in Figs. 3, 4, and 8. The whole of the spaces may be filled in with pleasing tints of colour, after the manner of linoleum, tile work, or mosaic.

Pattern work of this kind provides great scope for originality on the part of the pupils. It is something well within their scope and capacity. The power to make good original arrangements of geometrical forms comes before the power to make original decorative units from floral forms. After a good geometrical repeat has been made, simple leaf or flower forms may often with advantage be placed within the spaces.

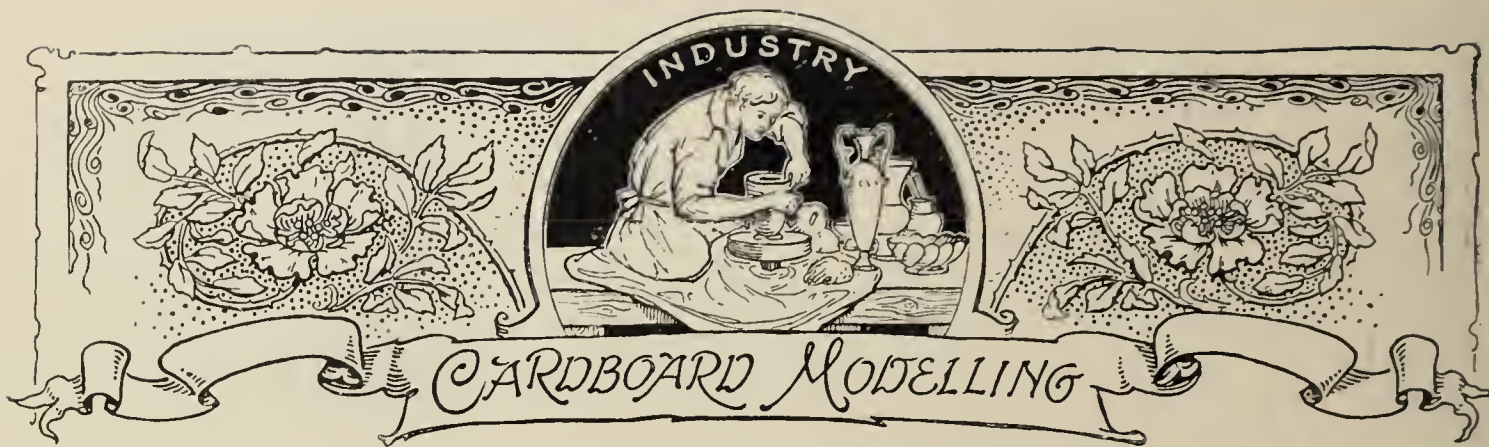
When colour is used, a good firm outline is necessary to separate the varying tints.

Geometry of a practical kind, such as is needed for cardboard modelling, scale drawing, pattern drawing, and in connection with design, now largely takes the place of the old course of geometrical drawing—dividing lines and angles, finding proportionals, etc. Many of these problems still have to be done, but they form parts of other exercises instead of standing unrelated and alone. The pupil can see the need of them, and the reason for accuracy of work. Indeed, the resulting figure is often a clear proof of the accuracy or otherwise of the working. Mechanical drawing can now be made entirely practical, to the immense advantage of the pupil educationally.

PLATE XXI.



Stage V.—GEOMETRICAL PATTERN DRAWING.



ALL the preliminary portions of this work were dealt with in Stages III. and IV. It is very essential that the instructions referring to cutting, covering, mounting, and binding should be closely followed. A little error or want of knowledge in any of these processes makes the work not only more difficult, but less efficient. At whatever stage pupils begin a course of this work, these fundamental exercises must be gone through. The preliminary directions are not repeated here; but unless they are well understood, the previous handbooks should be studied, until the proper technique of cutting the cardboard, gluing up the model, mounting the covering papers, and binding the edges is thoroughly mastered. Perfect models are the result of correct manipulation at every stage. The following is the briefest possible summary of the essential points:—

Cutting and Gluing.

Cut lightly, using little physical force. Two or three light cuts are far better and more effectual than a single heavy one. Heavy pressure blunts the knife and produces a ragged edge. Use the thinnest possible film of seccotine or glue on the joints—not more than the adhesive on a postage stamp. Spread it on with a thin strip of waste cardboard.

Covering.

Cut the paper accurately to the required size, and fit it into position without damping. Raise one half carefully, and damp the card underneath; press the paper gently down. Repeat the process for the second half.

Binding.

Narrow binding gives a neater appearance than wide. Fold the paper first as in Fig. 62, and then cut the strip to the required width. The space marked here is $\frac{1}{4}$ ", but it may be less. It is far better to fold the paper before cutting, otherwise it is most difficult to fold a long slip of paper or cloth exactly down the centre.

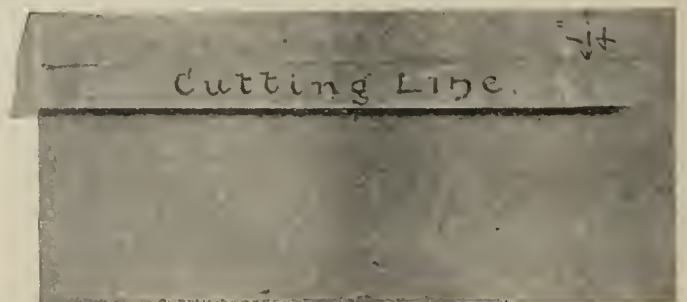


Fig. 62.—Cutting binding paper.

Mitring.

Fig. 63 shows how corners may be mitred. The four strips for the square were each cut 4" in length. If they be fastened on so, then the corners, where the paper would be double, look very bulky

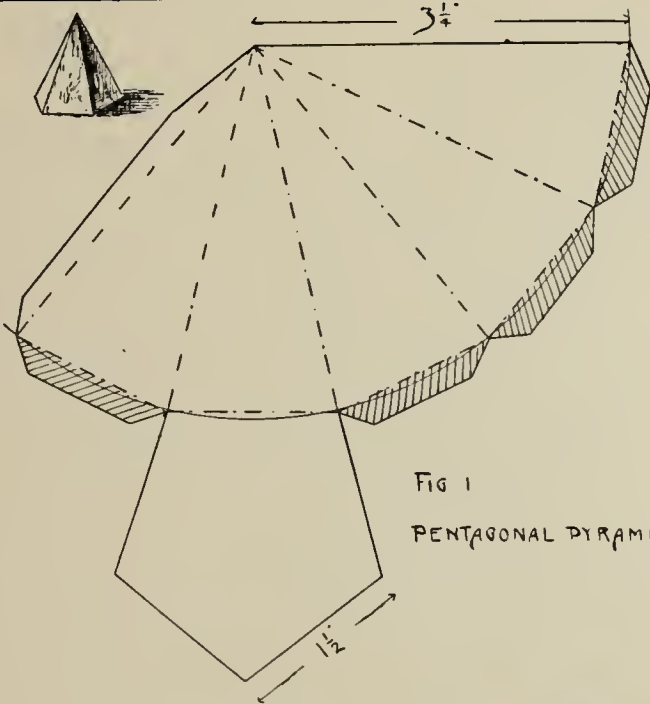


FIG 1
PENTAGONAL PYRAMID

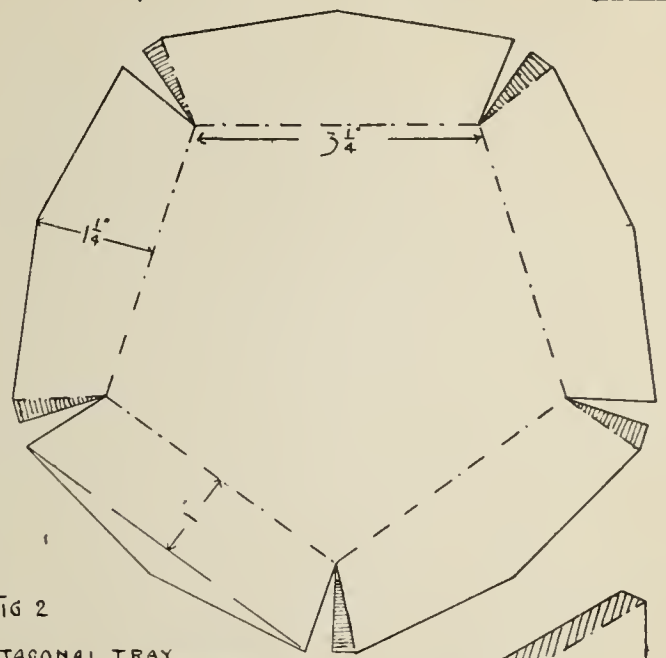


FIG 2
PENTAGONAL TRAY

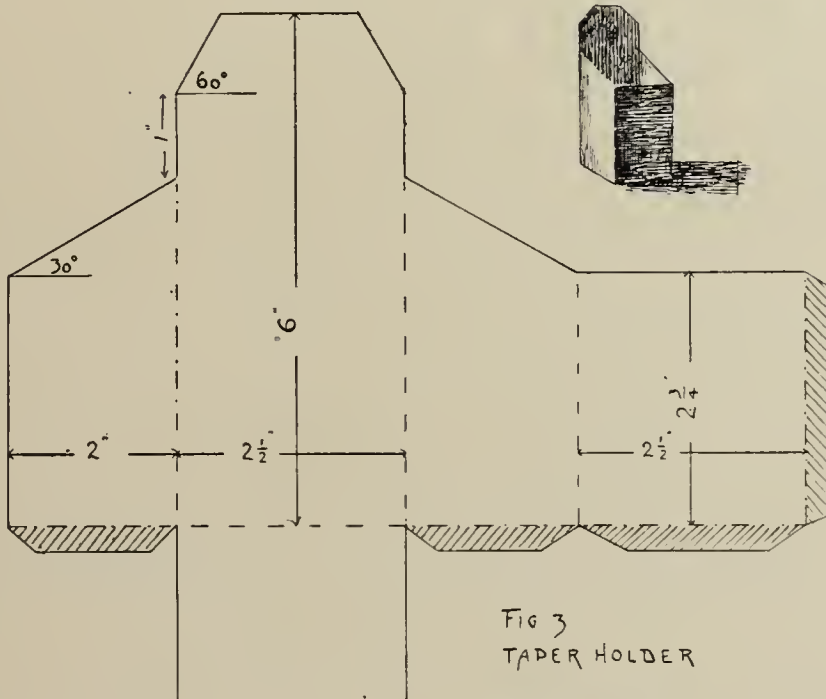


FIG 3
TAPER HOLDER

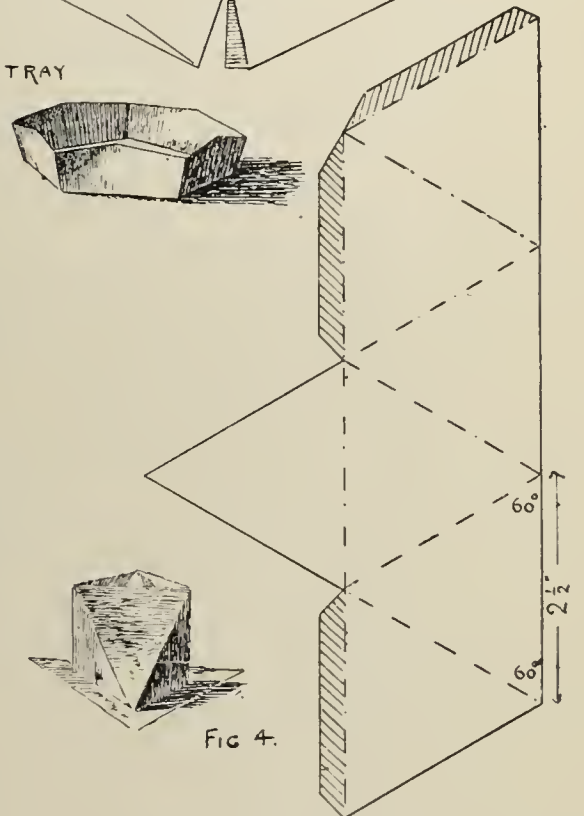


FIG 4.

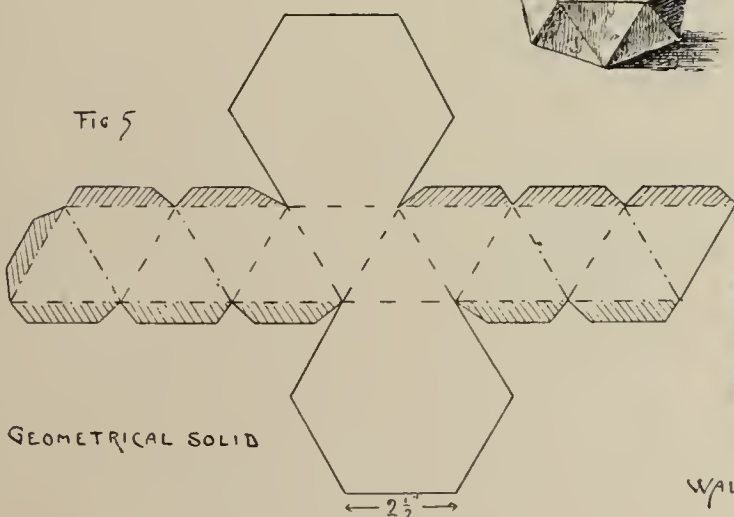


FIG 5
GEOMETRICAL SOLID

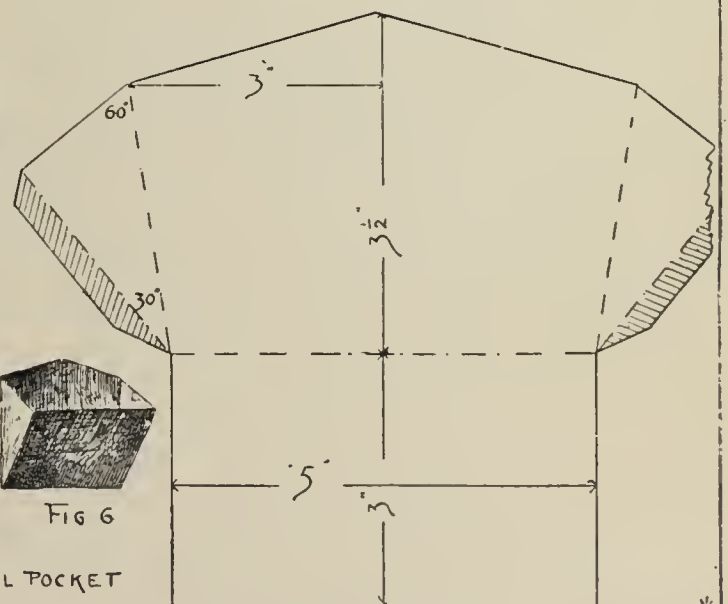


FIG 6
WALL POCKET

and untidy. The ends are therefore "mitred," like the corners of a picture frame. This is not an easy matter, and at first a sort of compromise is adopted.

Two edges are put on entire, like the top and bottom edges in Fig. 63. The third strip is then placed in position, as shown on the right; and the lines AB and CD are

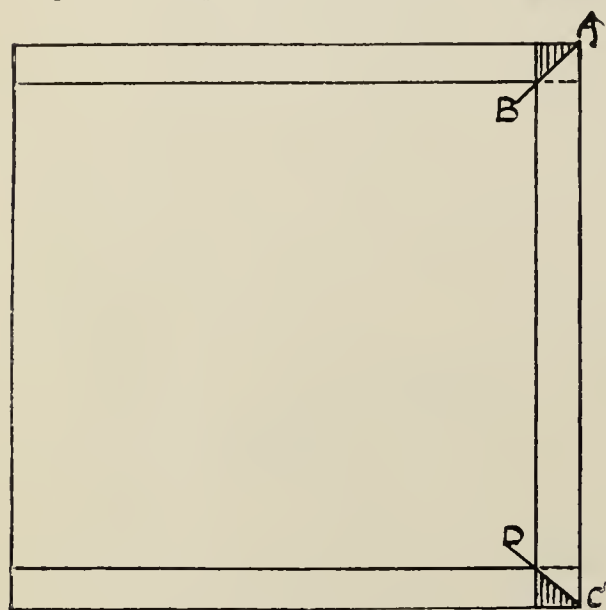


Fig. 63.—Mitring the corners.

very carefully drawn in pencil, so as to exactly bisect the right angles. The strip ABCD is then removed, and the small shaded portions cut away. Treat the opposite edge in a similar manner, and mount the strips.

This, of course, produces a sort of false mitre; but it is as much as can be reasonably done with the materials and tools the scholars have in use at present. Even this demands considerable care and skill, and paves the way for making true mitres at a later stage.

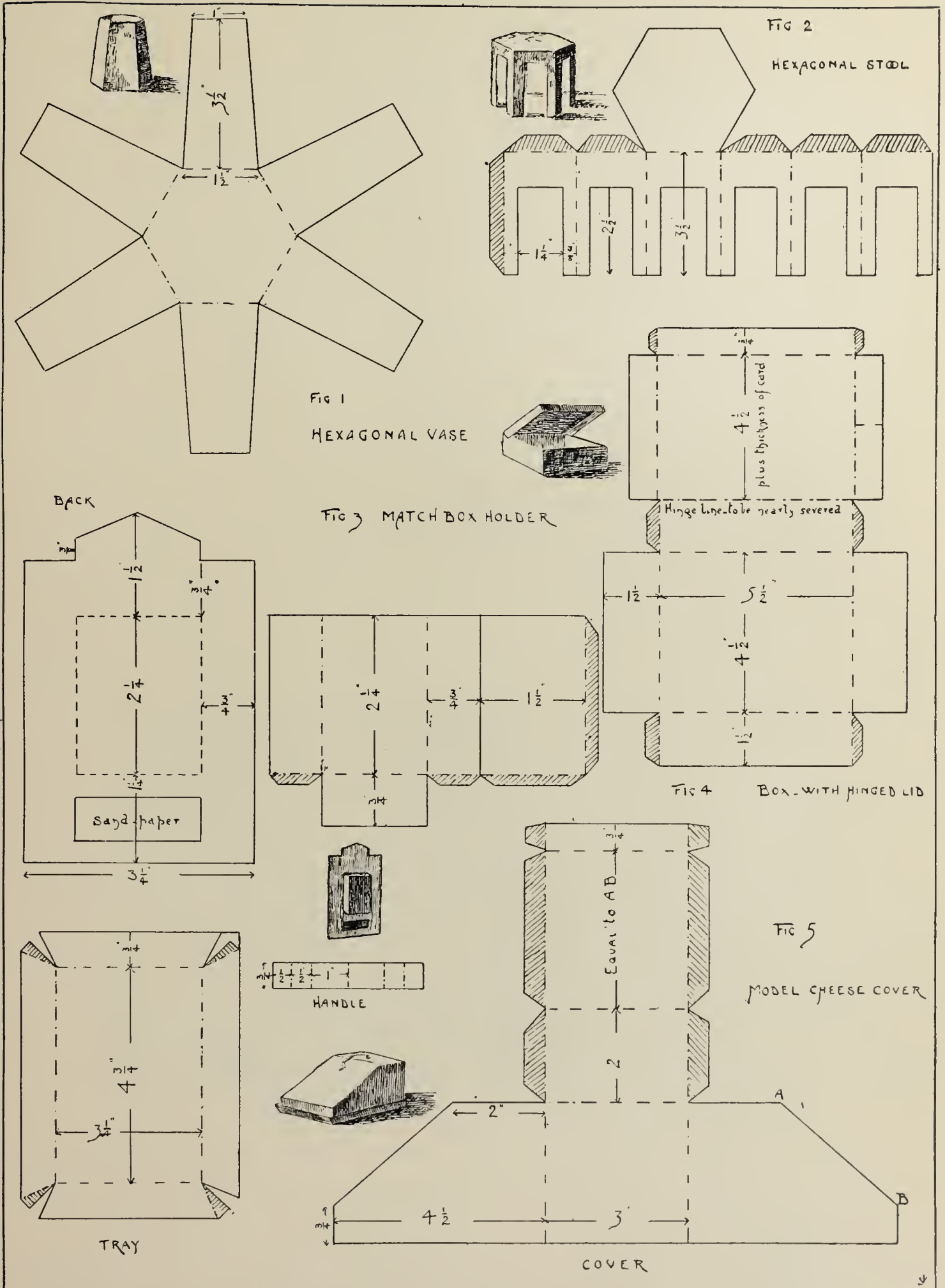
No extra materials are required; a knife, brass ruler, and zinc plate are all the tools needed.

Two or three new simple processes are introduced in this stage: a greater use is made of cloth for binding, and fancy covering papers are used instead of plain. This does not, of course, affect the underlying principles, but the bookbinders' cloth is stronger than paper, and is more difficult to cut and more stubborn in binding. It can be obtained with adhesive on the back, similar to the coloured papers, or without it, in which case it needs seccotine or glue spread over it. Fancy covering papers are not sold with adhesive on the back. For mounting these, either paste or gloy is very suitable. There are some beautiful and decorative patterns, and when suitably chosen they greatly enhance the appearance of the model. As in Stage IV., some of the models are covered with plain paper, or even left with the plain cardboard and then decorated with the brush. Suggestions for filling any of the spaces can be obtained from the brush-drawing section.

The exercises themselves do not need any individual comment. The photographic groups represent respectively the models whose developments are shown on Plates XXII., XXIII., and XXIV. The small sketches at the side of the "developments" on the plates serve to connect the two things. As in the previous stages, the shaded portions represent the attachments, which have to be glued; the chain lines represent the "half cut" edges, and the continuous lines those edges which have to be completely severed. Suitable dimensions are given, but these need not be adhered to.

Many of the models have the edges bound first, and are covered afterwards. Take Fig. 1, Plate XXII., for example. The model was drawn, cut out, and glued up as usual. The edges were then bound. Lastly, triangular pieces of paper for the sides and a pentagonal piece for the base were cut, slightly smaller than the model. These, when fixed on, allowed about

PLATE XXIII.



$\frac{1}{16}$ " of the original binding to show. The taper holder was done in the same way. In Fig. 4 the triangular base may be made of any convenient size; fairly stiff card should be used. Sometimes it is necessary to cover the surfaces before gluing up the model.

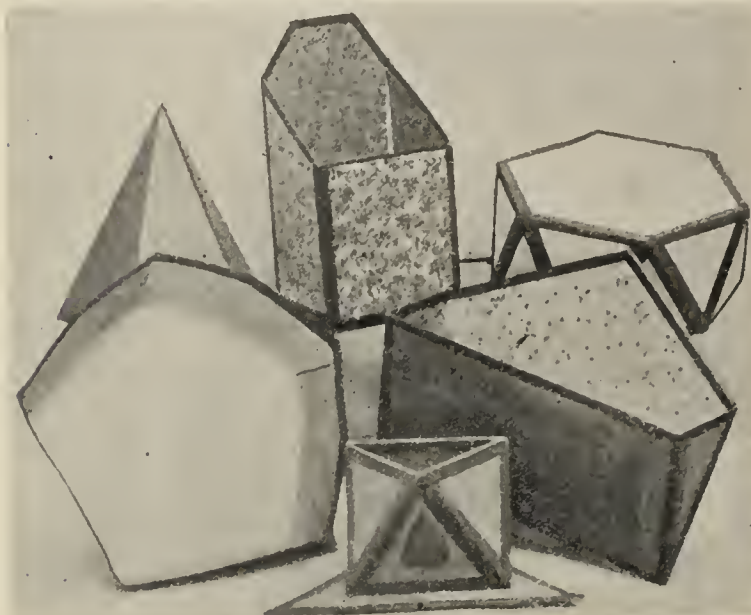


Fig. 64.—Models whose developments are shown on Plate XXII.

there are no flaps on the development of Fig. 1. In models of this kind, where the resistance is not great, and where the flaps rather detract from the appearance inside, the binding at the edges is sufficiently strong to secure the sides to each other. If

In Fig. 6, Plate XXII., for example, the inside at least must be so treated, for it would be well-nigh impossible to put on a covering paper neatly after the model was fastened up. The gloy or paste should be spread very thinly on the back of the fancy covering papers.

The vase form,
Plate XXIII. stool, and match
holder shown in

the photograph are alternative examples to those whose developments are shown in Figs. 1, 2, and 3.

It will probably be noticed that

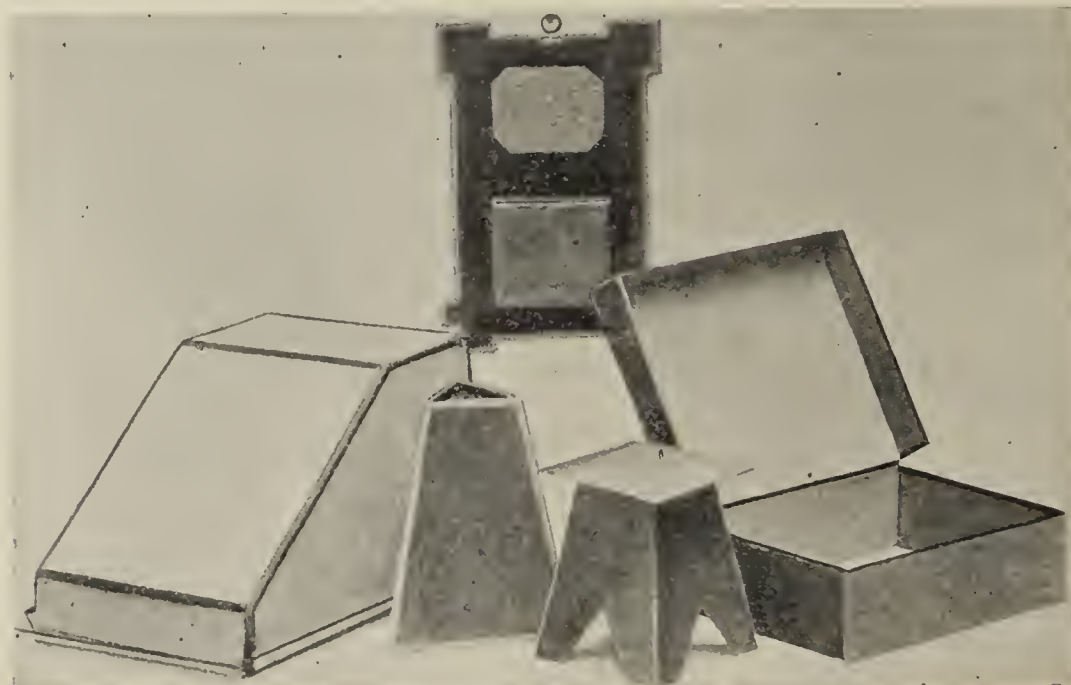


Fig. 65.—Models whose developments are shown on Plate XXIII.

it is desired to cover the inside of the vase, this must, of course, be done before the model is fastened up.

Fig. 4, though simple enough in development, needs very careful work. Note particularly that the oblong at the upper portion of the drawing, which will form the

FIG. 2
BOX with division

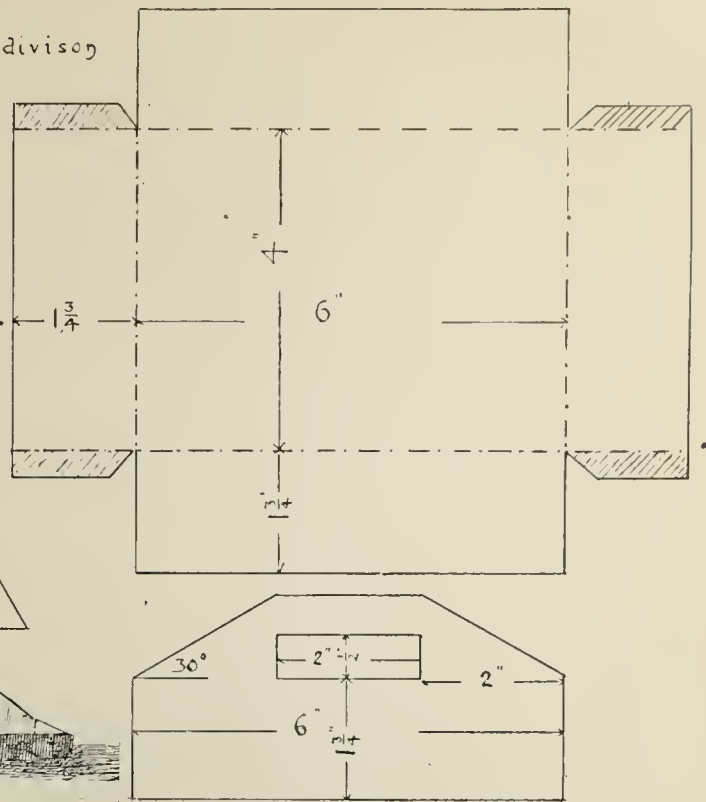


FIG 1 GEOMETRICAL SOLID

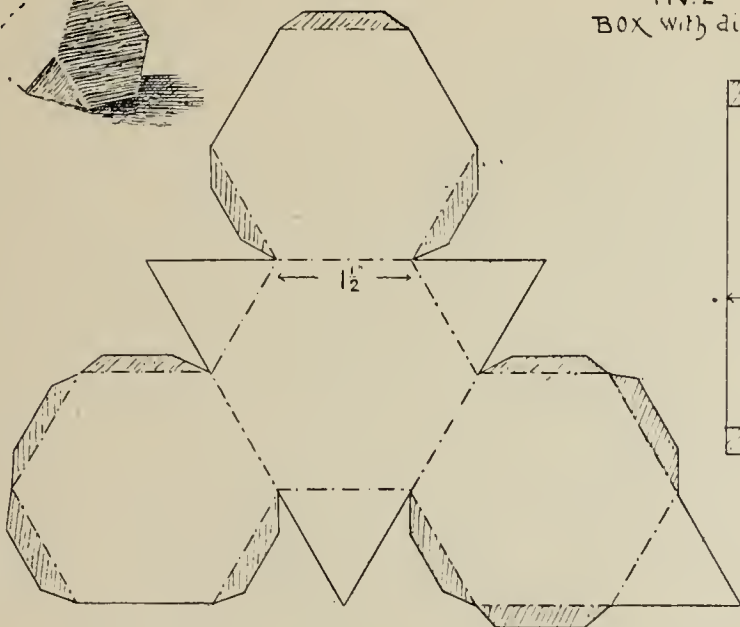


FIG 3 VASE

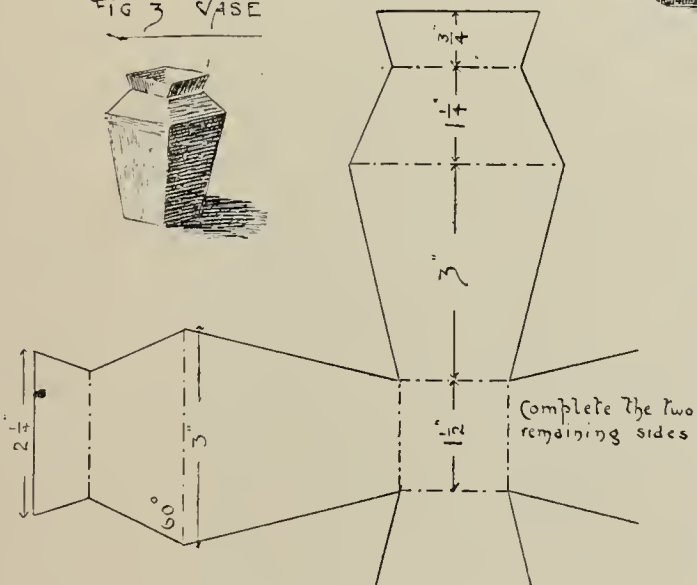


FIG 4
MATCH-HOLDER

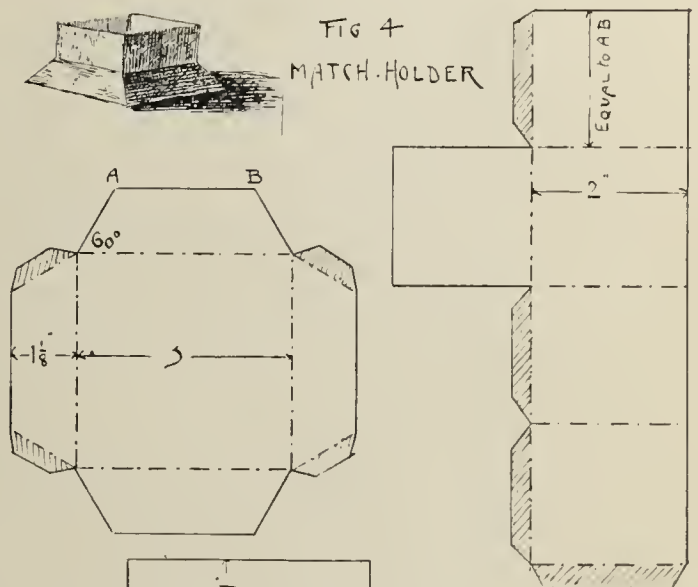
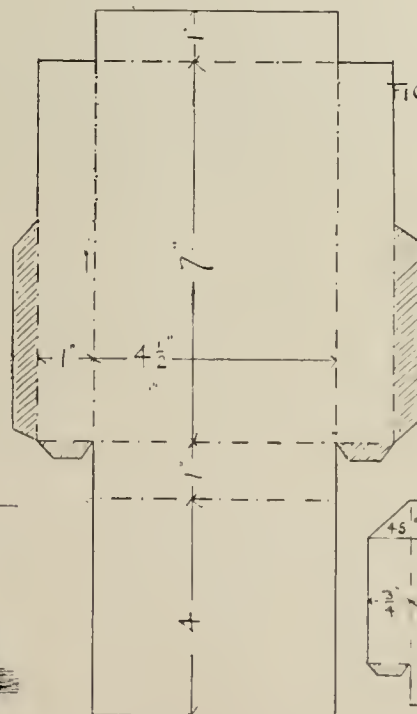


FIG 6 STATIONERY CASE



Falling front

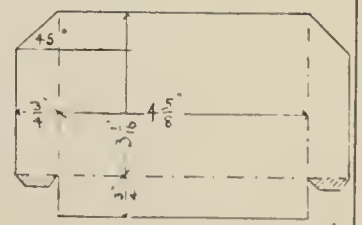
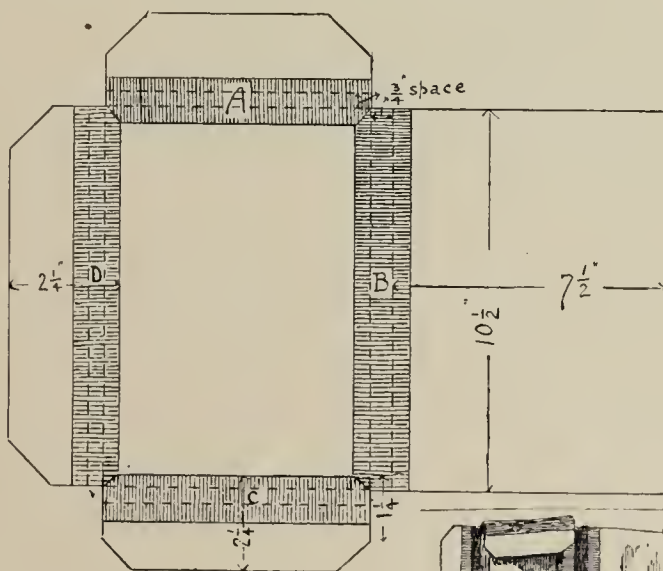


FIG 5 PORTFOLIO



lid of the box, is just a shade larger than the lower oblong. The increase is only sufficient to allow for the thickness of the cardboard, and so permit the lid to shut with ease and yet be a good fit. The line forming the hinge should be strengthened either by a strip of tracing cloth or by a strip of binders' cloth on both sides. The constant opening and shutting of the lid necessitates a good strong hinge.

Fig. 5 makes a very interesting model, and is not at all difficult. Many similar suggestions may be got from articles of everyday use.

When models consist of two or more parts, it is of course
Plate XXIV. essential for the several portions to be fixed firmly together. In
 Fig. 2 the division is fixed in the centre by means of strips of

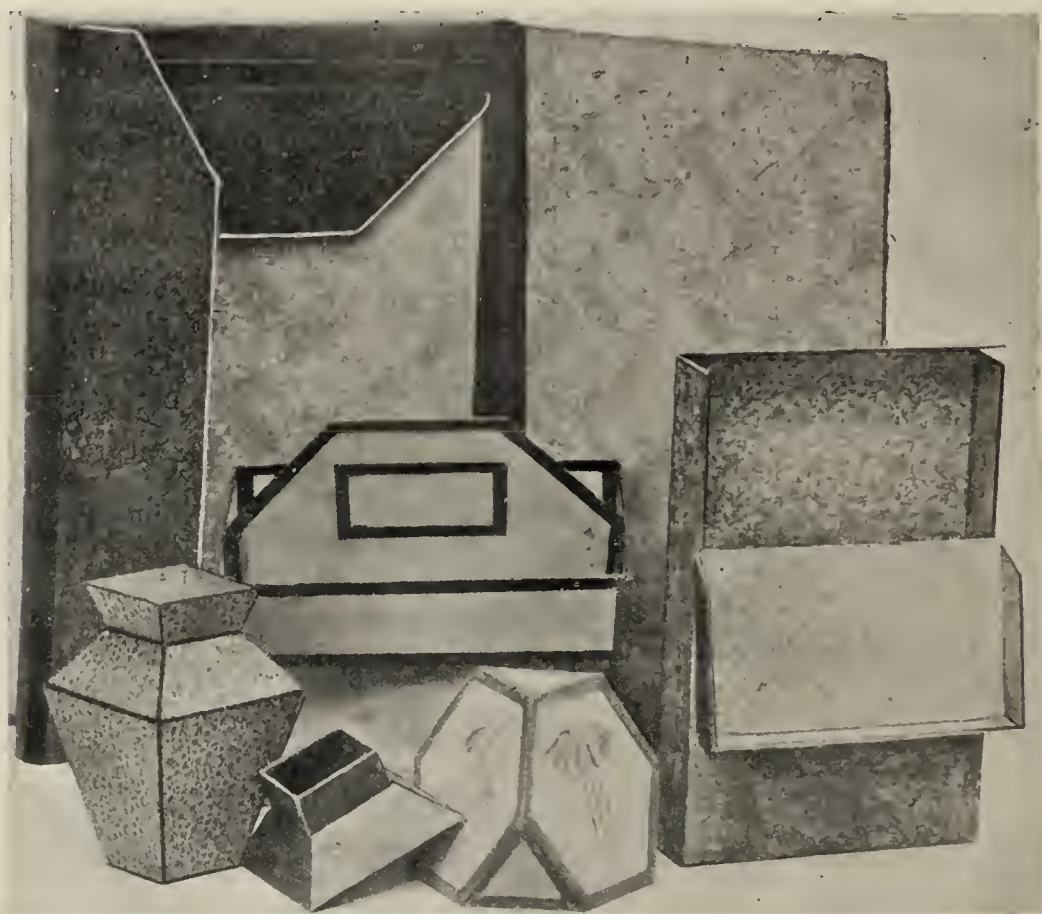


Fig. 66.—Models whose developments are shown on Plate XXIV.

binders' cloth, exactly in the same manner as the edges are bound. The strips are secured firmly to the bottom first, and then to the upright division. These models will not stand much wear and tear.

The sides of Fig. 3 are treated in the way suggested for Fig. 1 in Plate XXIII.

In Fig. 4 the base or sloping portion is made first, and then the square box to fit it.

For Fig. 5 five pieces of stout cardboard—two for the sides and three for the flaps—are cut of the required dimensions. These are then connected together by pieces of binders' cloth. There is, however, a fair space ($\frac{3}{4}$ ") left between the edges of the card; this is shown by A, B, C, and D. The binders' cloth goes $\frac{1}{2}$ " over each edge of the

card, and is thus firmly secured. When all four edges are done on the outside, place a similar piece on the inside, so that the hinges are formed by a double thickness of strong binders' cloth, and are not likely to give way. Cover in the usual way if necessary. This is a most useful model. The specimen photographed has been in use for years.

In Fig. 6 the front is made separately, and then attached to the body by means of a strip of tracing cloth or binders' cloth. The former is very thin and tough, and is excellent for such a purpose. The ordinary binding will probably be strong enough for the flap at the top.

It is quite possible that in many town schools the boys at this stage will be taking woodwork. In that case, cardboard modelling would be omitted. Without doubt, however, a course of cardboard work gives an excellent preliminary training for working in the more stubborn materials, such as wood or metal. In each case careful working drawings must be prepared, and accurate tool manipulations must follow, if the result is to be successful. As far as the demand on mere accuracy is concerned, cardboard work is more severe than woodwork or metal work; for if the working drawing varies but ever so little from what it should be, the finished model is a permanent record of the error.

It is sometimes urged against the subjects that demand accuracy, that they are "mechanical." This is true in a sense, in so far as they are produced by mechanical instruments—rulers, compasses, and various other tools. But the operations themselves are in no sense "mechanical." They need the greatest care, thought, and precision, in order to secure even moderately successful work. Operations can, of course, be repeated until they become "mechanical;" but this never occurs in a well-planned course of manual instruction, and true educational handwork is well worth its place in the school curriculum for training the mental faculties as well as teaching manual dexterity.



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